

You can be anything you want!

A randomized-controlled trial to broaden adolescents' occupational interests *

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Abstract

We investigate if changing students' personal mindsets (by allowing them to explore their own interests), affects the way in which they acquire information about possible careers and in which they process information about higher education (formal education and vocational training). We find that students who participated in our intervention seek information about more diverse career paths, and shift their focus from occupations that require university education towards occupations that require a high school degree. We do not find that they process higher education-related information differently than students who participated in a placebo intervention. This seems to be because students shifted their information acquisition away from occupations that require a university degree towards occupations that require a high school degree, such that high school-related information remained equally relevant to students in both groups, and was thus appropriately processed. *JEL: C93, D83, D91, I21, O15*

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1 Introduction

A vast literature highlights that educational decisions are prone to several forms of behavioral biases (Damgaard and Nielsen, 2018; Dynarski et al., 2021) and are often based on incomplete or incorrect information, for example, on costs and return to schooling (Jensen, 2010; Bettinger et al., 2012; Loyalka et al., 2013). In low- and middle-income countries, where students often receive limited guidance from parents and teachers, these frictions can be particularly severe and difficult to overcome without the aid of targeted policies.

Career-guidance tools that provide tailored advice on career options and corresponding educational pathways can be very consequential for students' choices and, eventually, for their economic outcomes and life-satisfaction. A key question is then what kind of advice should these tools provide to students. Giving feedback on academic ability –for example, informing students of how they rank compared to their classmates (Tran and Zeckhauser, 2012)– is controversial because of methodological and ethical reasons. From a methodological standpoint, measuring and scaling students' achievement is a non-trivial task, and can lead to a biased assessment of true ability (Jacob and Rothstein, 2016). In terms of ethics, Goulas and Megalokonomou (2021) show that feedback on relative performance (disclosed in a natural experiment) is highly asymmetric. It boasts the performances of high-achievers while depressing those of low-achievers, particularly girls, with long-lasting consequences for university enrollment and expected earnings. On the other hand, interest-based feedback requires assumptions on how students' personal interests, or students' personality types, should be measured, mapped, and linked to different job types.

In this paper, we choose this second route and implement a career-guidance intervention aimed at improving the quality of match between students' interests and career choices. Our design is informative of the extent to which the results are driven by the students' self-reflection on their own interests, rather than by the feedback itself (and thus on the specific implementation of our tool). We ask whether this intervention is successful in broadening students' perceived career prospects, which are initially very narrow, and study whether this expansion of occupational interests translates into being more receptive to information on paths to higher education.

We do so in a context –rural Cambodia– where students have a very limited horizon of potential careers. In a highly-powered pre-study, we find that more than 85% of the students we interview are interested in only three occupations: doctor, teacher, police officer. We also find that students are rather clueless about the educational pathways necessary to pursue such careers –for example, they largely misperceive the required educational degree for their aspired occupation and hold incorrect beliefs over the costs of attending high-school.

Furthermore, when provided with an unframed list of 18 job descriptions, most students tend to only engage with the three they reported previously.¹

There are many reasons why students may consider only such a narrow set of job options. Students may not know that certain jobs are a better match to their interests (or that certain jobs exist at all). Their career aspirations may be predominantly influenced by what they observe in their social networks (Jensen and Bursztyn, 2015), which could discourage them from learning about alternatives. They might also strategically choose to avoid or neglect certain information, because doing otherwise would force them to revise their plans in a way that is at odds with their self-image (Humlum et al., 2012) –for example, if they believe they already know which career they want to pursue. Students may also not be fully aware of their own interests, and instead rely on defaults (Damgaard and Nielsen, 2018), “the first jobs that come to mind”. Our experiment does not rely on one specific theoretical mechanism being at play, but rather targets directly the students’ “consideration sets” when it comes to job opportunities, which can be costly to expand (see Fershtman and Pavan 2022 for a theoretical contribution).

We deliver the intervention as part of a one day school workshop. Students work through an “Interest and Career Exploration Tool” (ICET), a digital application based on internationally-used personality tests (RIASEC). Through our ICET intervention, students explore their own interests, receive personalized feedback on their personality types, and are shown that these interests can map into interesting career opportunities. We provide them with detailed information on 18 possible careers –presented in personalized order– that are relevant to their context and that represent a substantial improvement, in terms of career outlook, over the professions of their parents.² After completing the applications, all students participate in an information session on education pathways, which provide detailed information on high schools and vocational training options as well as scholarship possibilities.

To test the effect of the intervention, we randomly assign 628 ninth-graders from 18 schools in rural Cambodia to one of two treatment arms: the first group of students work through the ICET, the second group through a placebo application with a similar structure but without any test-based or personalized content (students are asked questions about gender norms and climate change). We then study whether this personalized feedback changes the way in which students learn about their potential career options and the higher education pathways to pursue them, including financing possibilities.

¹In the placebo arm of our intervention, students dedicate 47% of their allotted reading time on career descriptions to just three out of eighteen occupations.

²In this context, 59% of working parents are farmers, 16% are small-scale informal traders, and another 11% are construction workers (Gehrke et al., 2023)

We find that our career-guidance tool is effective in shifting students' focus towards a wider set of occupations that require different (lower) levels of education. In particular, students in the ICET arm spend more time reading about occupations that are beyond their usual focus, and shift their reading time from careers that require a university degree towards careers that require a high school degree. This effect seems driven by mere introspection. While ICET students read job descriptions in line with the personalized test results they receive, they express interest in a more diverse set of occupations compared to the placebo group even before receiving personalized career information. Furthermore, we find that the ICET does not influence how students process information related to high school costs. This is not overly surprising, once considered that the intervention did not reduce the group of students for whom a high school education is relevant.

Our results are highly policy relevant: career guidance interventions that address concerns about education-job mismatches are particularly valuable in Cambodia, a country where university graduates had an unemployment rate three times higher than the less educated in 2012 (7.7% vs. 2.7% according to the National Institute of Statistics of Cambodia 2012) and where technician and associate professional positions are the most sought after (National Employment Agency of Cambodia, 2018). Yet, the same findings raise questions on the welfare implications of our intervention, particularly regarding inequality and social mobility. While the feedback we provide is based on the students' interests, rather than their academic ability, we find that students who become more interested in job descriptions that do not require a university education tend to perform worse in school at baseline (we use math and Khmer grades). This shows that students adjust their educational decisions away from options potentially too challenging for them, once they discover appealing alternatives. Importantly, we find no heterogeneous effect by family wealth, parental occupation, or parental level of education, suggesting that our intervention increases efficiency in the education sector without negatively affecting inequality or social mobility.

With this paper, we contribute to the literature on behavioral constraints to educational choice (see Damgaard and Nielsen 2018 for a review). This literature is often concerned with correcting students' (mis)perceptions over the costs and/or the returns to education (Abbiati et al., 2018; Wiswall and Zafar, 2015a,b; Dinkelman and Martínez A., 2014; Bettinger et al., 2012; Jensen, 2010). In particular, we show that the way in which information is delivered (here, individualized and interest-based) matters for how students learn about their occupational options.

Furthermore, we contribute to the literature on career guidance interventions in education. This literature is largely focused on increasing college attendance in the North American context (see Dynarski et al. 2023 for a review) and often uses “bundled interventions“

that simultaneously target several aspects of educational choice, including exploring career prospects (see for example Renée 2023). Here, we are concerned with one specific feature of our students’ decision-making process –their extremely narrow occupational interests. Moreover, our setting is a country that recently achieved lower middle-income status, and where transition into high-school is low despite government effort to expand access to education in recent decades (Ministry of Education, Youth and Sport, 2019). Our intervention is extremely cheap compared to bundled interventions typically considered in the literature, and can be easily scaled.

Our study also relates to a broader literature studying how people search and process information in the field (see the review by Capozza et al. 2021), and specifically how these processes can be affected by (personalized) feedback or advice. While much of this literature focuses on media consumption, particularly of political news, Belot et al. (2019) examine jobseekers’ search behavior after providing them with tailored advice on which jobs to apply for, based on representative labour market statistics. Interventions aimed at improving the quality of educational and occupational choices is even more beneficial for students, since such choices determine individual economic outcomes for a long period (almost the entire working-age). Moreover, there is evidence that children tend to choose the profession of their parents (Long and Ferrie, 2013), with potentially large consequences for intergenerational mobility (Almgren et al., 2023). Therefore, these interventions can be a first step to address inequalities and reduce labor misallocation later in the students’ life cycle.

The remainder of this paper is organized as follows. Section 2 explains the structure as well as content of the intervention, while Section 3 provides information on the experimental design (sampling, implementation of the intervention, and data collection). The empirical approach and results are discussed in section 4. Section 5 concludes.

2 Intervention

In our intervention, we implement an Interest and Career Exploration Tool (ICET), delivered in the form of a self-guided application on a tablet.³ In the design of the application, we build on Holland’s (1959; 1997) theory of vocational interest, also known as ”hexagonal model”. Holland’s theory maps people’s interests into six different personality types (visualized in Figure 1), namely realistic (or doers), investigative (thinkers), artistic (creators), social (helpers), enterprising (persuaders), and conventional (organizers). The three strongest personality types form the Holland Code of an individual. Holland’s theory posits

³The tablets were generously provided by the NGO GoAhead: <http://www.goahead-ngo.org/> for the time of the intervention.

that these personality types can be matched to occupations, and that individuals display higher satisfaction with their job if working in an occupation that matches their interests. A large literature provides evidence in support of the generalizability of Holland’s theory (Meireles and Primi, 2015), its cross-cultural transportability beyond the North-American and European context (Aljojo and Saifuddin, 2017; Morgan and de Bruin, 2018), as well as on the positive association between vocational identity and work-related outcomes, such as job satisfaction, performance and full-time employment (de Fruyt and Mervielde, 1999; van Iddekinge et al., 2011; Stoll et al., 2017).

The electronic application is designed to harness these insights, and consists of two parts: an interest exploration tool (IET) and a career exploration tool (CET). The IET is meant to help students reflect on their personal interests, and to identify students’ dominant personality types. The CET is dedicated to exploring career options, which are linked to the IET test results.

The personality test we implement as part of the IET combines responses from three different tests, all based on the hexagonal model (Holland, 1997). The first test is based on Athanasou (2000, 2007) and consists of 30 pairs of opposing statements, two for each combination of personality types. For each pair, students have to pick one statement (no skip is allowed). The statements cover a broad range of interests, are context-specific, relevant for ninth-graders, and exclusively activity-based (e.g., “negotiating prices at a local market”). The second test follows a widely used and internationally validated implementation of Holland’s personality test, developed through a cooperation between the Hawaii Department of Education and the Occupation Information Network (O*NET) (Hawaii Department of Education, 2020). It consists of a list of 42 statements (seven per personality type) for students to agree or disagree with (unlimited selections allowed). The third test, created by the authors, involves descriptions of five situations in which students are asked to select their preferred activities. These situational descriptions are tailored to the target population in rural Cambodia, depicting activities familiar to or accessible by adolescents (e.g., a wedding). In each of these situations, the student is given a number of potential activities they would be performing (e.g. in the context of the wedding: managing the guest list, performing on stage, decorating). Students are given 3 points which they can freely allocate between these six activities. More details about the structure of the IET is given in Appendix B, and the exact wording of all statements is shown in Appendix C.

The tests differ in format to limit students’ fatigue and to prevent that the outcomes are dependent on the design of a particular test. To enhance test comprehension, tests one and three also include pictures reflecting the content of the statements, and which were drawn by a local artist. These pictures are gender-neutral to avoid inadvertently influencing

students' choices: Either the gender cannot be inferred or both female and male individuals are displayed in each picture (see Figures B.1 and B.3 for a few examples).

From the responses across all three tests, the application computes scores that indicate the degree of alignment between the student (based on their choices) and each of the six personality types. The IET ends with a personalized display of these scores, visualized in a bar format. The score for the most dominant personality type is set to 100, while the scores of all remaining types are expressed relative to the main type. The three personality types with the highest scores (the Holland Code) are shown in the first row, while the remaining three types are displayed in the second row using less vibrant colors (Figure B.4 is an example of a personalized result). Students have the option to click on each personality type to access brief descriptions outlining the main personality traits and associated interests specific to that type. These descriptions are adapted from the Career Compass published by the Delaware Department of Labor (2019).

The tests were piloted several times to ensure students' understanding of the statements, as well as the appropriate weighting of the three tests in the calculation of the final scores. Since the tests were of different length and results from tests 2 and 3 deviated substantially from those in test 1, we eventually assigned weights of 0.05, 0.4 and 0.5 to the results of tests 1, 2 and 3, respectively.

The second part of our electronic application, the CET, is dedicated to the exploration of potential careers. For this purpose, we compiled a list of 18 occupations which are relevant for ninth-graders in rural Cambodia, and could be grouped by the personality types in the model of Holland and by the three levels of educational attainment realistic in this sample: lower-secondary, high school, or university degree. Table 1 contains all 18 jobs, organized by the occupations' matching personality types and educational requirements.

In a pilot study in 2019, we found that 85% of students in the target group aspire to the three following occupations: teacher, doctor, police officer. 90% of students aspire to one occupation of the three above or to soldier (see Table A.1). To increase relevance of the application for this group of students, we include the three most prominent occupations in the CET list: lower-secondary teacher⁴, general practitioner (doctor), and police officer.

The CET starts with a single page on which all 18 occupations are listed, and asks students to select up to three occupations they find potentially interesting. This selection page is unframed, in the sense that occupations are shown in random order and no additional explanation is provided (as displayed in Figure B.5). This unframed page is followed by a more detailed page on career options, in which the same 18 occupations are shown but this

⁴We wanted to give precise educational requirements in the text description, and these vary depending on the level at which the teacher is working. As such, we had to select one of the possible levels of instruction.

time ordered by personality types and educational level. The occupations are displayed in personalized order, *i.e.*, the same order in which the IET personality types are listed. All nine occupations relating to students' three strongest personality types are shown in the first row of the screen, while the remaining ones are shown in the second row (an example display is shown in Figure B.6). Each occupation also comes with a detailed description which focuses on the most important tasks, responsibilities, as well as their societal value, that can be accessed in the form of a pop-up window. The descriptions have on average five full sentences, three bullet points, plus the information on the required educational level (the exact wording of all job descriptions can also be found in Appendix C).

Students were able to decide how much time they wanted to invest on the job descriptions. They could log out immediately or spend up to 17 minutes on this last component. Based on data from the pilots, we estimated conservatively that it would take students around two minutes to read one occupation description. Therefore, students could read at least eight descriptions if they wanted.

During the intervention, research assistants guided students through the tests, and breaks were implemented between tests to ensure comprehension and adherence to instructions. Students worked independently once they understood the procedures, with the option to ask questions directly or access a pop-up window for additional instructions.

3 Experimental Design

3.1 Sample

We implemented our intervention in collaboration with Child's Dream (CD), an international non-governmental organization providing high school scholarships in Northwest Cambodia. Child's Dream operates in partnership with 51 lower secondary schools across 8 districts in 4 provinces (Battambang, Banteay Meanchey, Oddar Meanchey, and Siem Reap). For our research, we selected all 39 schools that were in collaboration with Child's Dream and had more than 30 students in Grade 9.⁵ To increase our sample, we added 21 schools from the same provinces with similar characteristics to the Child's Dream partner schools.

While these schools represent a specific subset of lower-secondary schools in rural Cambodia, a comparison with national statistics suggests that the sample schools are broadly similar to rural schools in general (Ministry of Education, Youth and Sport, 2019). The size of Grade 9 in the selected sample is nearly identical to the average rural school, with 89 students distributed across 1.89 classes in the selected sample and 90 students distributed

⁵The restriction on size was implemented to maximize the intervention sample given the available budget.

across 1.99 classes in rural schools. Examining class size and composition, both the average number of students (47) and the percentage of female students (54%) per class are remarkably similar between the selected sample and the rural average.

From the total of 60 schools, we randomly assigned 30 to receive the intervention (during a half-day workshop), while the remaining 30 were not visited. Randomization was stratified by district. Whenever schools had multiple Grade 9 classes, we randomized the class selected for the intervention.⁶ Baseline administrative data was collected by the project team from participating schools before the intervention took place.

3.2 Timeline and Treatment Arms

The implementation of the intervention started on February 17, 2020, and had to be interrupted as schools were closed on March 16, 2020 due to the COVID-19 pandemic. In this paper we focus on the 18 treatment schools that we were able to visit before the intervention had to be interrupted.

Out of the 862 students invited to participate in the intervention across the 18 treatment schools, 777 students actively took part.⁷ On the day of the intervention, students were randomly allocated to one of three treatment arms: the main treatment arm (ICET), a placebo arm (placebo), and an information-only arm (control). Once students arrived at the school, they blindly drew numbered badges from a box. Out of the 777 students, 315 were allocated to the ICET arm, 311 to the placebo arm and 151 to the control arm.

Students assigned to the three different arms took part in different activities as summarized in Table 2. First, all students took part in a baseline survey. The questionnaire was programmed in the mobile data collection platform ODK and filled by students individually on a tablet, with support from enumerators where necessary. This baseline questionnaire covered basic socio-economic characteristics, and questions related to expected high school distance and costs. These included (i) the costs of transportation per month when going to high school (e.g., by motorbike), (ii) the cost of extra classes (i.e., informal tuition) per month, (iii) the annual expenses for school material when going to high school, (iv) the total annual cost of attending high school, and (v) the travel time to high school by motorbike.

Afterwards, students in the ICET arm worked through the main application, students in the placebo arm worked through a different application, and students in the control arm

⁶In a few instances, class sizes were below 30, but multiple Grade 9 classes existed. In such cases, we combined two classes.

⁷Students received advance notice about the workshop and were informed that participation was voluntary. Those who did not attend the intervention exhibited lower overall academic performance and higher absenteeism in the months preceding the intervention. An additional 6 students came late and were allowed to participate in the activities of the control group, but are not included in the analysis.

participated in a group-based game outdoors. We programmed the placebo app to have a similar setup as the ICET. However, instead of asking questions related to interests and personality, we asked questions on gender norms and climate change awareness.⁸ Consequently, students in the placebo arm were not shown any personality test results. In the career exploration part of the placebo application, the occupations are grouped by personality type as in the ICET, but the groups are displayed in random order. While this resulted in a slightly shorter duration of the app-based intervention in the placebo arm, these differences were not noted in practice because students were seated in two different rooms.

Following the main intervention, students took a midline survey. The midline survey contained questions about perceived constraints to attending high school, and asked students to interpret a graph about high school-related costs. For the constraints, students were asked to rate five statements on a scale from zero to ten.⁹ The graph about high school related costs depicts average educational expenditures per grade in Cambodia. Students were shown a bar graph with educational expenditures from grade 6 to grade 10, where grades 6 to 9 included the actual amount in Cambodian RIEL displayed on top of the bar. Students were then asked to guess the absolute value (in Cambodian RIEL) of the educational expenditure corresponding to grade 10.

Students were then invited to participate in an information session about higher education. The information session encompassed three key components: essential facts about the Cambodian education system at large, detailed insights into nearby high schools and vocational schools suitable for students' transition after completing grade 9, and details on available scholarships for students to pursue. School-specific information included student numbers, proximity to the nearest school along with associated time and travel expenses, details about admission procedures, living costs, school-related expenses, and information on accessible scholarships. Although the overall structure of the information remained consistent across schools, it was customized to suit the specific location of each school. All students participated in this intervention, but three left during the session (one student from the ICET arm, two from the placebo arm).

Finally, in the endline survey we again elicited expectations about high school-related costs, as well as educational and occupational aspirations.

⁸Therefore, inferring gender effects between applications is not feasible, as placebo students are framed toward gender topics within the tests.

⁹The statements are (i) never want to move far from my home village, (ii) I think I will be able to graduate at high school within the three years if I went to high school, (iii) For the jobs that I would like to do the necessary/ required education is likely too costly for me and my family, (iv) I think my grades are not good enough to go to high school, and (v) It will be difficult to persuade my parents that they allow me to go to high school.

3.3 Baseline Balance

We present the results of balance checks in Table 3. In terms of baseline characteristics, we focus on student age, gender, and grades, on parental background, and on student answers in the baseline questionnaire (specifically, their expectations regarding high school costs). We present summary statistics for students in the main treatment arm (ICET) as well as those in the placebo arm.¹⁰

The sample consists of slightly more female than male students, who are on average 15 years old at the time of the interview. Students have 2.5 siblings on average and state to be relatively poor: their self-reported financial worries range around eight on a scale from one to ten. When asked how wealthy their families are relative to others in the village, most students report that their families were generally worse off. Students in our sample live an average of four kilometers from the school and about 10 kilometers from the district town and the next closest high school. All of these characteristics are balanced between the ICET and placebo arms. In terms of pre-intervention grades, however, we find that students in the ICET arm perform on average worse in the subjects math and Khmer than students in the placebo arm. The difference is statistically significant at the 10% level.

4 Empirical Approach

4.1 Estimation Strategy

With our intervention we encourage students to explore their own interests, and we show them that these interests can map into interesting careers. Our question is whether this changes students' mindset about occupational pathways and, in turn, the way in which students acquire and process the information that is made available to them. To do so, we consider four groups of outcomes.

With the first group of outcomes, we test if students in the ICET arm engage with the information provided to them differently from students in the placebo arm. We focus on students reading behavior in the career exploration tool. In particular, we consider (i) whether the student read any of the occupation descriptions, (ii) the total time spent reading, (iii) how many pages containing occupation descriptions the student opened, (iv) the average reading time per page, and (v) how many job descriptions the student actively read.¹¹

¹⁰Balance tables that include the control arm as well are in Table A.2 in the Appendix. Unfortunately, the control arm displays statistically significant differences along 6 out of the 17 tested characteristics, which is why we refrain from using the control group in our main analysis.

¹¹For this last outcome, we only count the number of pages that the student spent on for any time between 0.67 minutes (50th percentile of reading time per page) and 3.85 minutes (95th percentile of reading time

With the second group of outcomes, we test if ICET students acquire a different set of information than students in the placebo group. We focus on the fraction of the overall reading time that is spent on occupations requiring (i) vocational training, (ii) a high school degree and (iii) a university degree. Moreover, since 85 percent of students in our pre-study see themselves working in the same three occupations, we are particularly interested in whether the intervention makes students read outside this reference window. Therefore, we include as additional outcome the fraction of reading time spent on occupations outside this 85 percent reference window.

With the third set of outcomes we test if students in the ICET arm process information related to higher education more accurately than students in the placebo arm. The five outcomes we consider are students’ expectations over (i) the travel time to high school by motorbike, (ii) the costs of transportation per month when going to high school (e.g., by motorbike), (iii) the cost of extra classes (i.e. informal tuition) per month, and (iv) the annual expenses for school material when going to high school, as well as (v) the accuracy of students’ responses when asked about the non-governmental organizations that provide scholarships for the nearest high school.

Finally, with the fourth group of outcomes we test whether the combination of engaging with their own interests and receiving personalized feedback affects a student’s mindset. We focus on (i) the number of jobs (out of three) a student clicks on when presented with a list of 18 jobs and asked “Which of these jobs do you think could be interesting to you?” (first page of CET, see Table 2), (ii) how many of those are outside the 85% reference window, and (iii) which fraction of these are associated with different levels of education. Additionally, we consider two outcomes measured in the midline survey: (iv) the weight that students assign to constraints that could keep them from pursuing higher education (students are asked to rate five constraints on a scale from zero to ten, we take the average rating), and (v) student’s interpretation of the graph that depicts average educational expenditures per grade in Cambodia (i.e., the students’ guess on the absolute value of the educational expenditure that corresponds to grade 10).¹²

We estimate the following equation:

$$Y_{is} = \beta_0 + \beta_1 ICET_i + \beta_2' X_i + \lambda_s + \varepsilon_{is}. \quad (1)$$

per page). We use an upper limit to the time per page because we observed during the intervention that a number of students were un-engaged with the app, and simply stopped reading midway, but did not close the page or log out of the app.

¹²The latter two groups of outcomes are pre-specified in a pre-analysis plan (Gehrke et al., 2020), while the first two groups are additional outcomes. Given the strong imbalances documented between the ICET and the control arm, we deviate from the pre-analysis plan in that we do not include the control arm in the main analysis.

Outcomes of interest Y_{is} for student i in school s as listed above. $ICET_i$ is a dummy indicating whether the student worked with the ICET application (=1) or the placebo application (=0). X_i is a vector of student characteristics (in particular gender, age, and pre-intervention grades in Khmer and Math). λ_s are school fixed effects. ε_{ics} is the error term.

4.2 Results

Results for the first group of outcomes are presented in Table 4. We include controls stepwise to gauge the robustness of our findings, and report heteroskedasticity-robust standard errors throughout.

We find no evidence that students are more likely to read any of the career descriptions, which may not be surprising given that 97% of students in the placebo arm do so. Students in the ICET arms also do not open more pages containing occupation descriptions: if anything they open slightly less pages ($\beta = -.20$, over a placebo group mean of 6.52), but this result is not statistically significant. Total reading time also does not seem to be higher on average among students in the ICET arm, but the average reading time per page is lower: students in ICET seem to spend about 0.3 of a minute less on each page, over a placebo group mean of 1.9 minutes. This result is statistically significant at the 1% level. To better understand this results, it helps to consider the number of pages that students did actively read (rather than just open the page and closing it right away). The median read time per page is 40 seconds, which is considered the absolute minimum time students need if they want to process the full content of the page (according to the piloting results). The 95th percentile of reading time per page is 3.85 minutes, and should be more than sufficient time to read through the full text, even for students with low literacy. When counting pages that students read in this time range, we find that students in the ICET read about 0.3 more pages (12% gain over the placebo mean of 2.5). This latter result is statistically significant at the 5% level. These results suggest that, compared to students in the placebo arm, students in the ICET arm did not necessarily engage with the information more in terms of absolute time, but rather read in a more focused way.

Further, we examine the type of occupation-related information that students acquire (second group of outcomes). To do so, restrict our attention to the 601 students that did read at least one occupation description –as noted above, this outcome is not affected by the ICET. We find considerable differences between students in the two arms (*c.f.* Table 5). In the placebo arm, students spend 38% of the total reading time on occupations that require at least lower-secondary education, 16% of their reading time on occupations that require high school, and 46% of their time on occupations that require a university degree. This

is shifted in the ICET arm, with students spending (6.3pp) more time on occupations that require a high school degree, and (8pp) less time on occupations that require a university degree. Importantly, reading time also shifts away from the three occupations that are in the 85% reference window and featured in the app. While students in the placebo arm spend 47% of their time reading just about these three occupations, this fraction falls by 9pp (19% decline over the control group mean) in the ICET arm.

We further investigate how much of this shift could be driven by the order of occupations being personalized in the ICET arm (while it was random in the placebo arm). In Figure 3 (panel a), we plot the distribution of the personality types in our sample.¹³ The most common personality type in this group of students is social, followed by conventional and investigative. The three personality types that students in the sample display the least are enterprising, artistic and realistic. Contrasting this with the differences in reading time per personality type between treatment and placebo students (Figure 3, panel b), we find that students in both arms spent most time reading about occupations that are associated with two personality types: social and realistic. Statistically significant differences in reading time between ICET and placebo can be detected for three of the six personality types. For all personality types, the allocation of reading time in ICET moves closer to how the types are distributed in this sample (i.e., less reading time for social and realistic, more reading time for all other types).

Likely because information on high-school costs remain relevant to all students in our sample, we find no evidence of differential information processing between treatment and control students (third group of outcomes). Students in the ICET arm do not report more accurate educational costs nor are they better able to recall the information on high school scholarship opportunities provided in the information session. In table 6, we regress the endline beliefs with respect to travel time to high school (in minutes), monthly transportation costs, monthly costs for extra classes and annual costs for material on the treatment arm. As can be seen endline beliefs are largely identical between both groups. In columns 9-10, we test if students in the ICET arm are more likely to state the correct organization that provides high school scholarships in their region. Again, we find no statistically significant differences between both arms. To investigate the extent to which students updated their beliefs given the information we provided them with, we plot belief updating by baseline belief in Figure 4. As can be see all students update in the correct direction, and this is not

¹³We take the average over the strongest three personality types, and only include the 311 students for which the application properly recorded their choices. For four students the application malfunctioned either while taking the tests or while reading the occupational descriptions. In either case, the application had to be restarted and students were allowed to jump right back to the where they left (but with the disadvantage that the order of the occupations were not personalized anymore and that previous choices were overwritten).

differential by treatment arm.¹⁴

With the fourth (and final) set of outcomes we aim to uncover the mechanism through which the ICET treatment arm affects our outcomes. We ask two questions: *first*, does the interaction with ones interests already change an individual’s mindset regarding potentially relevant occupations? *Second*, does the personality test and personalized feedback change students’ beliefs about who they are and whether they are capable of attending high school (self-image)? Regarding the first mechanisms, we examine the effect of taking a personality test on stated occupational interest in the first page of the CET (see Table 7). We find that students in the ICET arm are already more interested in different occupations even before these are presented in personalized order. In particular we find that students express interest in a higher number of listed occupations, and a higher number of occupations that are outside the 85% reference window. Since the maximum number of occupations that can be selected is three, this effect is not purely mechanical. Students in ICET also tend to express more interest in occupations that only require a high school degree, rather than university. This shows that introspection alone is able to explain a substantial share of the observed effects on reading behavior, attenuating concerns that our results are driven entirely by the ordering of the results in the ICET arm (and could lead to misallocation of reading time if the test incorrectly mapped students’ interests). Regarding the second mechanism, we investigate if students in the ICET arm are more likely to see themselves as being able to go to high school. As can be seen in Table 8, we find no evidence that this is the case. Students in the ICET arm do express the same amount of concerns regarding their ability to attend high school (measured in the midline survey as the average weight given to five constraints). They also do not interpret the cost graph in a more favorable way. Again, this result might be driven by the fact that students attention did not shift away from occupations that required at least high school (but instead within the group of these occupations from occupations that require a university degree to those occupations that require ”only” a high school degree).

4.3 Welfare Implications

A natural question, then, is whether the shift in student attention away from occupations requiring university to occupations requiring high-school have implications for inequality and social mobility. If our intervention discourages well qualified students from relatively low socio-economic backgrounds from attending university, then this intervention would have the potential to be welfare reducing. We therefore explore whether we can identify which

¹⁴In table A.3 in the Appendix, we use the absolute difference between endline beliefs and the true value minus the absolute difference between baseline beliefs and the true value as outcome. Again, we find no difference in belief updating between treatment and placebo.

ICET students shift their focus away from university-requiring occupations.

Table 9 additionally shows that this sorting is based on academic ability only (average math and Khmer grade), and not based on parental occupation (i.e., whether parents are farmers), on parental educational attainment (i.e., whether parents have a job that requires higher education), or on family wealth (neither self-reported by the students nor reported by the teachers). In Figure 5 we look at heterogeneous treatment effects on reading time by occupations' educational requirement and baseline math grade in more detail by plotting the non-parametric association between reading time and baseline grades for ICET and placebo students separately. We find that, compared to the placebo, ICET students who have lower-than-average maths grades spend less time on occupations requiring a university education, and more time on occupations requiring only a high school diploma. The difference is more pronounced the lower the student's math grade is, while it disappears for students with average or above-average maths performance.

To the extent that these baseline grades are informative about inherent student ability, these results are indicative of positive welfare effects. Improving the match between occupational interest and student academic ability increases efficiency in the education sector, as it allows students to sort more effectively into the tracks that suit them better. The fact that this sorting does not correlate with socio-economic background, enhances the potential of similar interventions to increase social mobility and to reduce inequality.

5 Conclusions

This paper analyzes whether giving students the opportunity to explore their own interests and providing them with personalized feedback on career opportunities changes the way in which students acquire occupation-related information, and how students process information related to high school.

Our results suggest that students who worked through the ICET rather than through the placebo application acquired more information about occupations outside their reference window, and about occupations that require only a high school degree rather than a university degree. We find similar shifts when investigating students' stated occupational interests before the information is ordered by personality types, suggesting that a least part of the effect on information acquisition can be attributed to a change in students' mindsets as they engaged with their personal interests (and not only to the order in which information was presented in the career exploration tool).

In contrast, the ICET seems to have had no effect on how students processed high school-related information, nor on their self-image regarding their capability of attending

high school. This is consistent with the shifts in occupational interests documented above: rather than shifting their interests away from occupations that require a high school degree, students interests seemed to shift away from occupations that require at least a university degree. As such the group of students for which a high school education was perceived as relevant did no change due to the intervention.

These results suggest that providing students the tools they need to explore their own interests and with personalized feedback can be an important intervention to support students in acquiring and processing information that is in principle self-relevant, but in practice not sufficiently sought after (potentially because it does not confirm their priors).

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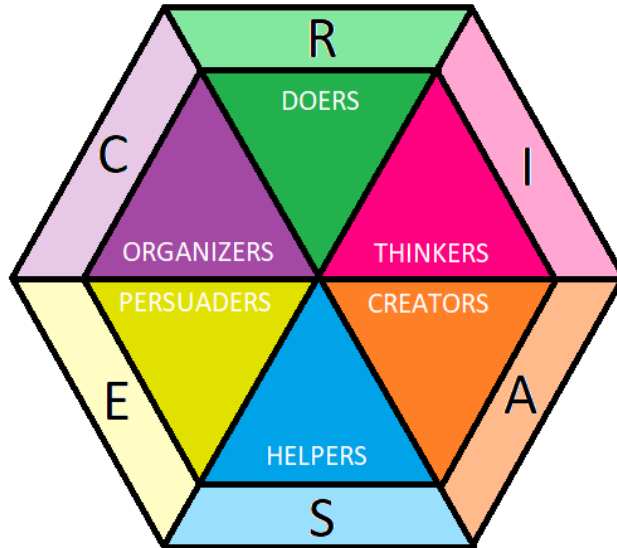
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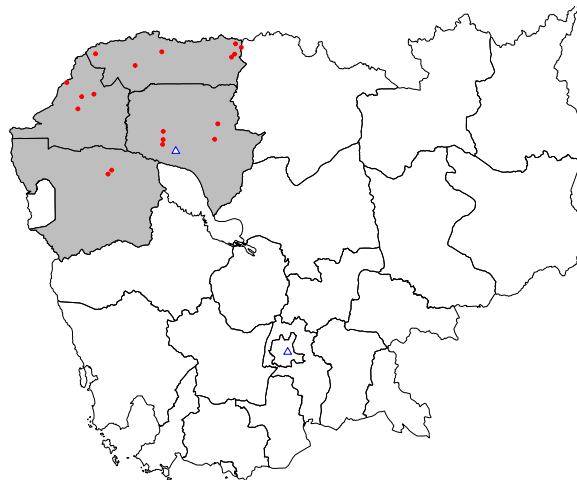
Figures

Figure 1: Holland's Hexagonal Model



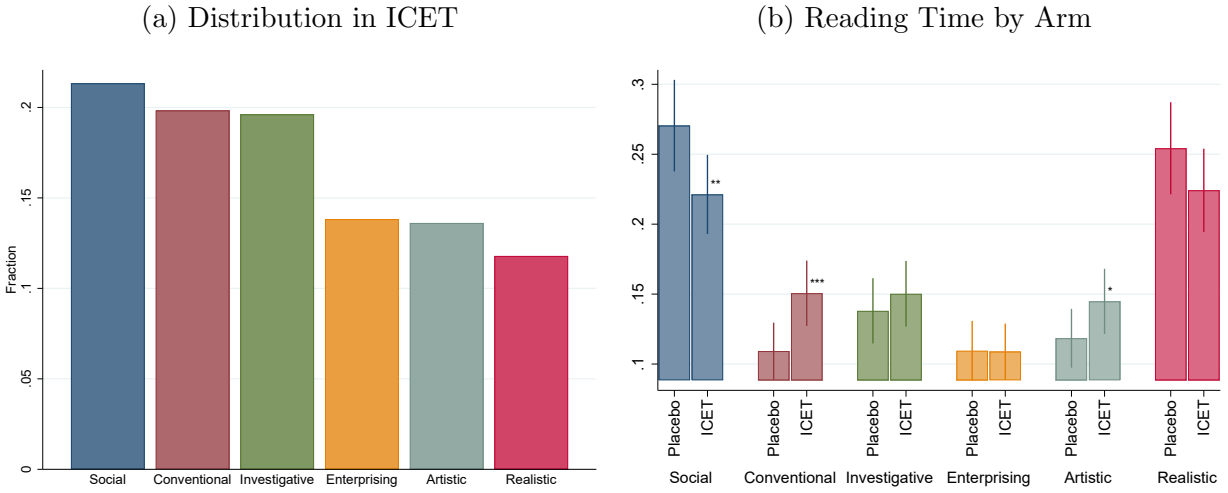
Notes: Own illustration based on common visualizations of the Holland model found online. R stands for realistic, I for investigative, A for artistic, S for social, E for enterprising, and C for conventional.

Figure 2: Map of Sample Schools



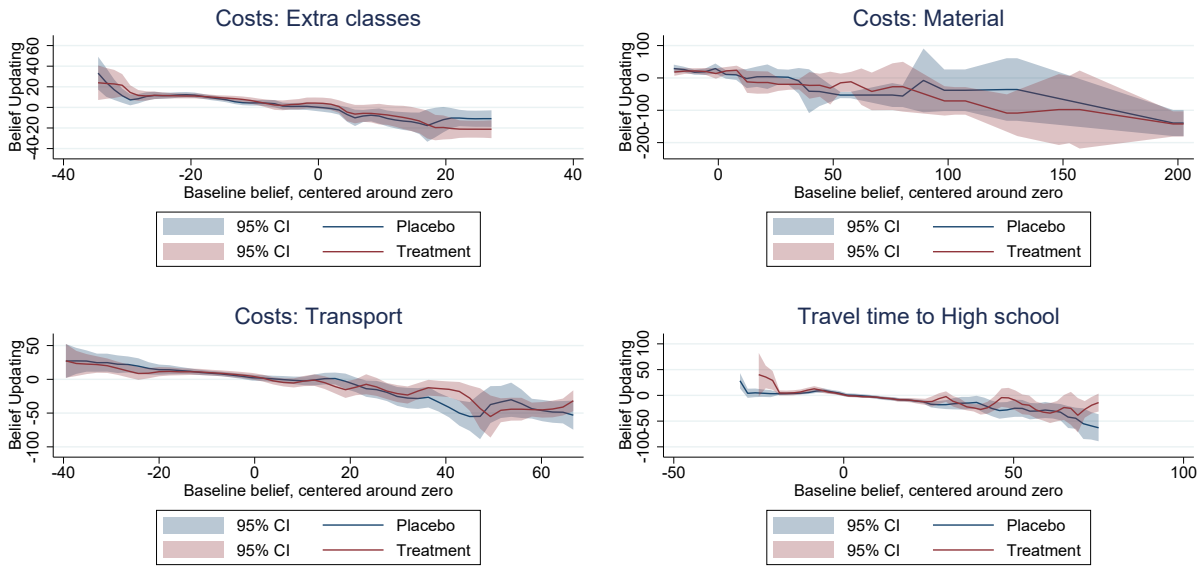
Notes: This maps highlights the locations of all 18 intervention schools in red. The four provinces of interest are colored in gray. The capital Phnom Penh is represented by the blue triangle in the South, Siem Reap is the blue triangle in the North.

Figure 3: Holland Code



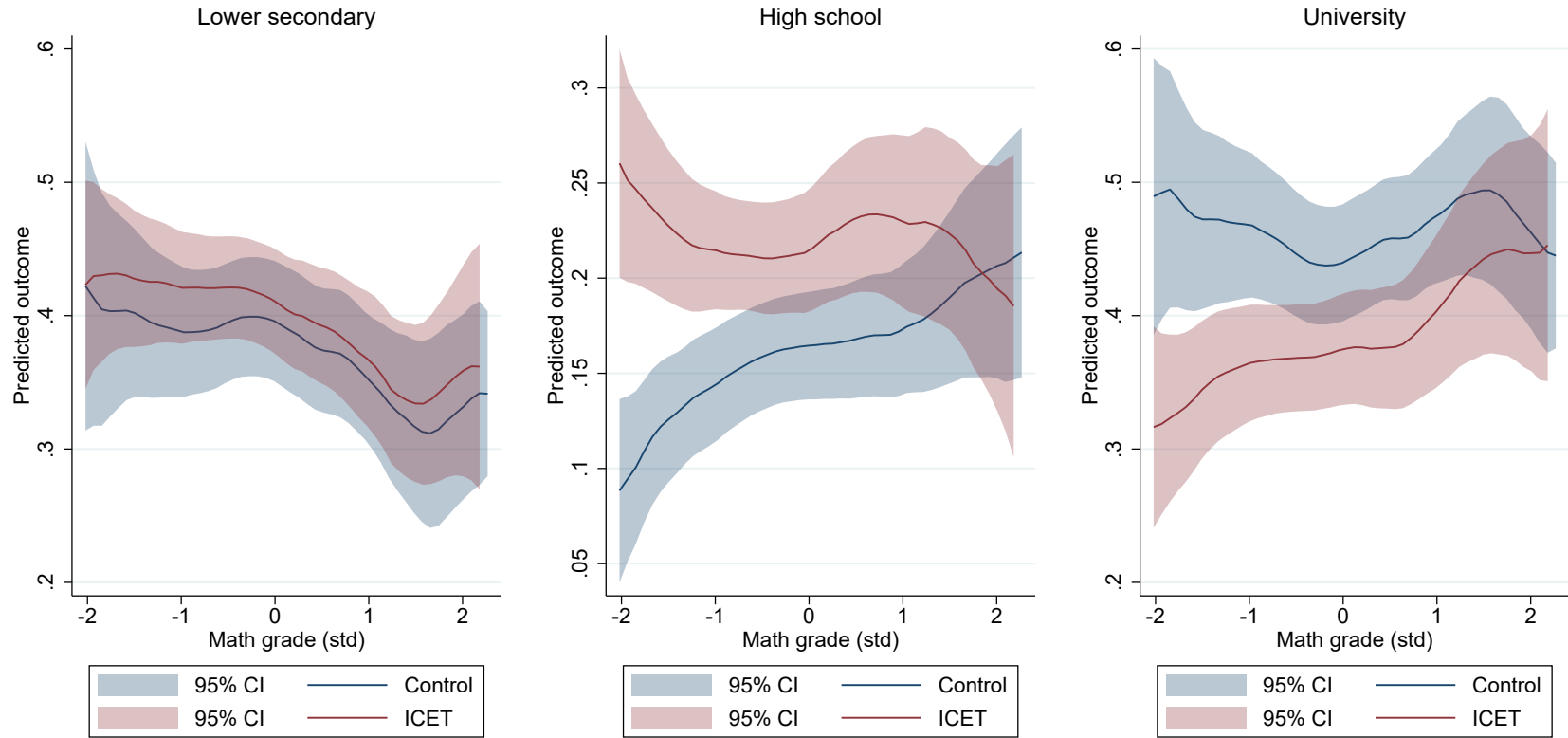
Notes: Panel (a) shows the distribution of the personality types (Holland Code) in the ICET arm, based on students answers to the personality tests. We take the average over the three strongest personality types. Panel (b) shows the relative reading time by Holland Code of the occupation in the ICET and Placebo arms.

Figure 4: Belief Updating about High School



Notes: Belief updating is the difference between a student’s endline and baseline estimates wrt the outcome. The graphs show local linear regressions of belief updating on baseline beliefs (centered at the true value for that student), with 95% confidence intervals.

Figure 5: Predicted Reading Time by Occupations' Educational Requirement and Baseline Math Grade



Notes: Math grade is the average grade in Mathematics

Tables

Table 1: Job Categorization in the CET

Type	Required educational degree		
	grade 9	grade 12	university
Realistic	police officer	agric. technician	civil engineer
Investigative	carpenter	journalist	general practitioner
Artistic	photographer	clothes designer	architect
Social	tour guide	social worker	sec.-level teacher
Enterprising	chef	real-estate agent	sales manager
Conventional	receptionist	office administrator	software developer

Notes: Each occupation is assigned to one of the six personality types and to one of three educational degrees. The former categorization relies on the classification by the NEA, the latter is categorized by the research team.

Table 2: Outline of the Intervention

	A1: ICET	A2: Placebo	A3: Control
Baseline survey	Background information on student('s family); beliefs about costs of attending high school		
	TREATMENT	PLACEBO	NO TOOL
IET	(a) three tests on personal interests and preferences (b) personality types	(a) three tests on gender attitudes and climate change (b) —	game outdoors
CET	(a) list of 18 jobs; students indicate most interesting ones(s) (b) list of 18 jobs (ordered by personality types), students can click on each job to read more detail	(a) list of 18 jobs; students indicate most interesting one(s) (b) list of 18 jobs (ordered randomly), students can click on each job to read more detail	game outdoors
Midline survey	Perceived constraints of attending high school; quizz: interpreting graph with costs of education		
SCHOOL INFORMATION SESSION	Detailed information on high schools and vocational training, including costs involved and available scholarships		
Endline survey	Questions capturing information retention; aspirations and expectations on education and career path		

Table 3: Balance Table

Variable	(1) Mean ICET	(2) Mean Placebo	(3) ICET - Plac
Female	0.54 (0.50)	0.53 (0.50)	0.00 (0.95)
Age	15.37 (1.05)	15.37 (1.21)	-0.00 (0.96)
Num siblings	2.50 (2.06)	2.58 (1.69)	-0.08 (0.60)
Financial worries 0-10	7.75 (2.86)	7.94 (2.82)	-0.19 (0.40)
Wealth rel. to others	3.30 (0.70)	3.30 (0.59)	-0.00 (0.96)
Distance to school (km)	3.98 (3.86)	3.99 (4.02)	-0.01 (0.99)
Distance to district town (km)	9.96 (6.47)	9.74 (6.45)	0.22 (0.68)
Distance to high school (km)	9.33 (6.59)	9.27 (6.37)	0.06 (0.90)
Avg. Math Grade (Dec&Jan, std.)	-0.18 (0.93)	-0.05 (0.96)	-0.13* (0.09)
Avg. Khmer Grade (Dec&Jan, std.)	-0.24 (0.93)	-0.10 (0.98)	-0.14* (0.06)
Avg. Math Grade (Dec&Jan, std.)	-0.23 (0.83)	-0.17 (0.81)	-0.06 (0.35)
Avg. Math Grade (Dec&Jan, std.)	-0.12 (0.98)	-0.05 (1.03)	-0.08 (0.33)
Avg. Absence (Dec&Jan)	1.63 (1.88)	1.59 (1.96)	0.05 (0.76)
Expected costs high school: total	291.52 (369.41)	274.86 (331.81)	16.65 (0.55)
Expected costs high school: extra classes	15.39 (14.28)	16.41 (13.86)	-1.02 (0.37)
Expected costs high school: transport	22.96 (22.09)	22.19 (19.94)	0.77 (0.65)
Expected costs high school: material	35.80 (54.90)	35.57 (53.75)	0.23 (0.96)
Observations	315	311	626

Notes: (1) and (2): standard deviations in parentheses; (3): derived by regressing variable of interest on treatment dummy, robust p-values reported in parentheses. */**/** denote significance levels at 10/5/1 percent respectively. The highest achievable points in Khmer, English, and Math are 100, 50 and 100, respectively. Absences are absent days per month (note that for one school this information is missing). The Total grade is the sum of individual subjects and includes additional subjects to the ones reported here.

Table 4: Interaction with Career exploration tool

	Read any job		No. of pages opened		Total reading time		Av time p/page		No. of pages read	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICET	-0.016 (0.015)	-0.015 (0.016)	-0.285 (0.395)	-0.175 (0.393)	-0.216 (0.341)	-0.158 (0.345)	-0.300 (0.102)***	-0.301 (0.102)***	0.299 (0.162)*	0.326 (0.160)**
School fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓		✓		✓
Placebo Mean	0.97		6.52		8.64		1.90		2.54	
Observations	626		626		626		626		626	

Notes: OLS estimates. Read any job is a dummy equal one if student opened at least one job description. Number of pages opened is the total number of job descriptions that were opened. Total is the total time the students spent reading job descriptions. Pages read is the number of pages a student spent on long enough to read through text (between 0.7 minutes and 3.85 minutes, i.e. the 50th and 95th percentiles of reading time per page). Individual controls include gender, age, average Math and Khmer grade prior to the intervention. Robust standard errors are depicted in parentheses. */**/** denote significance levels at 10/5/1 percent respectively.

Table 5: Information Acquisition - Career Exploration Tool

	Occupations' educational requirements						Occupations are outside 85% ref window	
	lower secondary		high school		university		(7)	(8)
	(1)	(2)	(3)	(4)	(5)	(6)		
ICET	0.023 (0.024)	0.016 (0.024)	0.062 (0.017)***	0.062 (0.017)***	-0.085 (0.025)***	-0.078 (0.025)***	0.096 (0.026)***	0.088 (0.026)***
School fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓		✓
Placebo Mean	0.38		0.16		0.46		0.53	
Observations	601		601		601		601	

Notes: OLS estimates. The outcome variable is the fraction of reading time dedicated to occupations that require at least lower-secondary education (cols. 1-2), high school (cols. 3-4), a university degree (cols. 5-6), and the fraction of reading time dedicated to occupations outside the 85% reference window (cols. 7-8) or 90% reference window (cols 9-10). Individual controls include gender, age, average Math and Khmer grade prior to the intervention. Robust standard errors are depicted in parentheses. Robust standard errors are depicted in parentheses. */**/** denote significance levels at 10/5/1 percent respectively.

Table 6: Costs and Distance Estimates about High School, Scholarship Knowledge

	Absolute Difference between Students' Endline Estimates and Truth in								Names correct	
	Distance to HS		Transportation Cost		Cost Extra Classes		Material Cost		Scholarship	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICET	0.895 (1.383)	0.226 (1.356)	1.702 (1.323)	1.734 (1.320)	0.352 (0.840)	0.125 (0.828)	-2.655 (3.857)	-3.197 (3.890)	-0.019 (0.037)	-0.011 (0.037)
School fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓		✓		✓
Placebo Mean	11.81		13.69		12.88		26.25		0.45	
Observations	623		623		623		623		623	

Notes: OLS estimates. Outcome variables are centered around the (school-specific) true value (in absolute terms), i.e. a negative coefficient indicates that estimate is closer to the truth. Cost estimates converted to US-\$. All estimates are winsorized at 95th percentile. Individual controls include gender, age, average Math and Khmer grade prior to the intervention. Robust standard errors are depicted in parentheses. */**/** denote significance levels at 10/5/1 percent respectively.

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Table 7: Stated Occupational Interests

	Total occup. selected		No. of occup. outside 85% ref window		lower secondary		Fraction of selected jobs requiring			
							high school		university	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICET	0.250 (0.080)***	0.249 (0.080)***	0.197 (0.072)***	0.176 (0.072)**	0.014 (0.027)	0.010 (0.027)	0.055 (0.019)***	0.053 (0.019)***	-0.070 (0.029)**	-0.063 (0.029)**
School fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓		✓		✓
Placebo Mean	2.04		0.67		0.97		0.32		0.13	
Observations	626		626		626		577		577	

Notes: OLS estimates reported. This table compares students' choices in the unframed job selection between students in A1 (full treatment) with students in A2 (placebo). Individual controls include gender, age, and average Math, English and Khmer grade prior to the intervention. Robust standard errors are in parentheses, */**/** denote significance levels at 10/5/1 percent respectively.

Table 8: Student perception of high school feasibility

	Constraints to high school		Cost of grade 10	
	(1)	(2)	(3)	(4)
ICET	-0.026 (0.140)	-0.102 (0.138)	51.492 (79.329)	71.732 (79.721)
School fixed effects	✓	✓	✓	✓
Individual controls		✓		✓
Placebo Mean		5.74		150.37
Observations		626		626

Notes: OLS estimates. Cost estimates centered around true value (1405). Robust standard errors are depicted in parentheses. Individual controls include gender, age, distance to school, distance to high school, average Math, English and Khmer grade prior to the intervention. */**/** denote significance levels at 10/5/1 percent respectively.

Table 9: Treatment Effect Heterogeneity - Reading Time Dedicated to Occupations Requiring High School

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICET	0.063 (0.025)**	0.058 (0.017)***	0.057 (0.016)***	0.047 (0.021)**	0.087 (0.096)	0.003 (0.088)	0.059 (0.035)*	0.060 (0.018)***
ICET × Female	-0.002 (0.034)							
ICET × Avg. Math Grade (Dec&Jan, std.)		-0.036 (0.017)**						
ICET × Avg. Khmer Grade (Dec&Jan, std.)			-0.031 (0.018)*					
ICET × Avg. Absence (Dec&Jan)				0.010 (0.009)				
ICET × Wealth (reported by teacher)					-0.009 (0.032)			
ICET × Self-reported wealth (rel. to others)						0.018 (0.026)		
ICET × Parents are farmers							0.003 (0.040)	
ICET × Any parent has high educ job								0.021 (0.056)
Female	0.056 (0.023)**	0.056 (0.017)***	0.058 (0.017)***	0.057 (0.017)***	0.055 (0.017)***	0.055 (0.017)***	0.055 (0.017)***	0.054 (0.017)***
Age	0.005 (0.008)	0.006 (0.008)	0.005 (0.008)	0.003 (0.008)	0.006 (0.008)	0.006 (0.008)	0.005 (0.008)	0.005 (0.008)
Avg. Math Grade (Dec&Jan, std.)	0.026 (0.011)**	0.044 (0.013)***	0.026 (0.011)**	0.028 (0.011)**	0.026 (0.011)**	0.026 (0.011)**	0.027 (0.011)**	0.026 (0.011)**
Avg. Khmer Grade (Dec&Jan, std.)	-0.025 (0.011)**	-0.025 (0.011)**	-0.010 (0.013)	-0.022 (0.011)**	-0.025 (0.011)**	-0.026 (0.011)**	-0.025 (0.011)**	-0.025 (0.011)**
Avg. Absence (Dec&Jan)				0.003 (0.006)				
Wealth (reported by teacher)					-0.000 (0.022)			
Self-reported wealth (rel. to others)						-0.014 (0.019)		
Parents are farmers							-0.023 (0.026)	
Any parent has high educ job								-0.021 (0.030)
Observations	601	601	601	601	598	600	601	601

Notes: OLS estimates. The outcome variable is the fraction of reading time dedicated to occupations that require a high school degree. Each regression controls for gender, age, average Math and Khmer grade prior to the intervention and for school fixed effects. Robust standard errors are depicted in parentheses. */**/** denote significance levels at 10/5/1 percent respectively.

APPENDIX

A Supplementary Tables

Table A.1: Occupational Aspirations among Grade 9 Students

Occupation	Freq.	Percent	Cum. Percent
Teacher	102	57.95	57.95
Doctor	31	17.61	75.56
Police officer	19	10.80	86.36
Soldier	8	4.55	90.91
Farmer	3	1.70	92.61
Government staff	3	1.70	94.32
Other	10	5.68	100.00
Total	176	100.00	

Notes: Data collected during preliminary study in 2019. Survey question: When you are about 25 years old, what job would you like to be doing? (open ended).

Table A.2: Balance Table - All Treatment Arms

Variable	(1) Mean A1	(2) Mean A2	(3) Mean A3	(4) A1 - A2	(5) A1 - A3	(6) A3 - A2
Female	0.54 (0.50)	0.53 (0.50)	0.66 (0.47)	0.00 (0.95)	-0.13*** (0.01)	0.13*** (0.01)
Age	15.37 (1.05)	15.37 (1.21)	15.33 (1.10)	-0.00 (0.96)	0.03 (0.75)	-0.04 (0.73)
Num siblings	2.50 (2.06)	2.58 (1.69)	2.76 (1.86)	-0.08 (0.60)	-0.26 (0.17)	0.18 (0.31)
Financial worries 0-10	7.75 (2.86)	7.94 (2.82)	7.48 (2.96)	-0.19 (0.40)	0.26 (0.37)	-0.45 (0.12)
Wealth rel. to others	3.30 (0.70)	3.30 (0.59)	3.27 (0.62)	-0.00 (0.96)	0.02 (0.70)	-0.03 (0.65)
Distance to school (km)	3.98 (3.86)	3.99 (4.02)	4.21 (4.28)	-0.01 (0.99)	-0.22 (0.58)	0.22 (0.60)
Distance to district town (km)	9.96 (6.47)	9.74 (6.45)	9.74 (6.44)	0.22 (0.68)	0.22 (0.73)	-0.00 (1.00)
Distance to high school (km)	9.33 (6.59)	9.27 (6.37)	9.17 (6.40)	0.06 (0.90)	0.17 (0.79)	-0.10 (0.87)
Avg. Math Grade (Dec&Jan, std.)	-0.18 (0.93)	-0.05 (0.96)	0.12 (1.00)	-0.13* (0.09)	-0.30*** (0.00)	0.17* (0.08)
Avg. Khmer Grade (Dec&Jan, std.)	-0.24 (0.93)	-0.10 (0.98)	0.05 (0.92)	-0.14* (0.06)	-0.29*** (0.00)	0.15 (0.12)
Avg. Math Grade (Dec&Jan, std.)	-0.23 (0.83)	-0.17 (0.81)	-0.03 (0.96)	-0.06 (0.35)	-0.20** (0.03)	0.14 (0.13)
Avg. Math Grade (Dec&Jan, std.)	-0.12 (0.98)	-0.05 (1.03)	0.11 (1.13)	-0.08 (0.33)	-0.24** (0.03)	0.16 (0.14)
Avg. Absence (Dec&Jan)	1.63 (1.88)	1.59 (1.96)	1.28 (1.45)	0.05 (0.76)	0.36** (0.02)	-0.31* (0.05)
Expected costs high school: total	291.52 (369.41)	274.86 (331.81)	289.57 (312.18)	16.65 (0.55)	1.95 (0.95)	14.70 (0.64)
Expected costs high school: extra classes	15.39 (14.28)	16.41 (13.86)	14.20 (12.02)	-1.02 (0.37)	1.19 (0.35)	-2.21* (0.08)
Expected costs high school: transport	22.96 (22.09)	22.19 (19.94)	20.31 (21.36)	0.77 (0.65)	2.65 (0.22)	-1.88 (0.37)
Expected costs high school: material	35.80 (54.90)	35.57 (53.75)	30.83 (49.79)	0.23 (0.96)	4.97 (0.33)	-4.74 (0.35)
Observations	315	311	151	626	466	462

Notes: (1)-(3): standard deviations in parentheses; (4)-(6): derived by regressing variable of interest on treatment dummy, robust p-values reported in parentheses. */**/** denote significance levels at 10/5/1 percent respectively. The highest achievable points in Khmer, English, and Math are 100, 50 and 100, respectively. Absences are absent days per month (note that for one school this information is missing). The Total grade is the sum of individual subjects and includes additional subjects than the ones reported here.

Table A.3: Belief Updating about High School

	Absolute Difference at Endline (Estimate - Truth) minus Abs. Diff at Baseline in							
	Distance to HS	Transportation Cost	Cost Extra Classes	Cost Material				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICET	2.310 (1.390)*	1.913 (1.393)	0.254 (1.638)	0.160 (1.628)	-0.468 (0.882)	-0.436 (0.887)	-1.924 (4.816)	-2.806 (4.879)
School fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓		✓
Placebo Mean		-7.63		-1.79		-3.28		-2.87
Observations		623		623		623		623

Notes: OLS estimates. Outcome variables is the amount of belief updating, i.e. $|Y_{ijt} - \hat{Y}_j| - |Y_{ijt-1} - \hat{Y}_j|$. Cost estimates converted to US-\$. All estimates are winsorized at 95th percentile. Individual controls include gender, age, distance to school, distance to high school, and average Math and Khmer grade prior to the intervention. Robust standard errors are depicted in parentheses. */**/** denote significance levels at 10/5/1 percent respectively.

B Composition of ICET

The development of the application was realized with a Cambodian consultant and implemented with a Cambodian programmer.

The application content is based on the hexagonal model from Holland (1997) which is characterized by six personality types: the realistic (R) personality type is also called “doers”, investigative (I) type or “thinkers”, artistic (A) type or “creators”, social (S) type or “helpers”, enterprising (E) type or “persuaders”, and finally conventional (C) type or “organizers”. The model is visualized in Figure 1. The number of personality types differ in models and personality tests developed later. For example, Tracey and Rounds (1995) argue to use between six and eight types, while (Athanasou, 2007) uses ten types. However, any set larger than six is mostly a combination of the six original ones, hence we opted to use the initial set-up. The personality types are determined by a test that we call Holland test and RIASEC test interchangeably throughout the text. The term Holland Code refers to the three strongest types only.

We use the hexagonal model because it has been used by The National Employment Agency (NEA) of Cambodia, which produced a paper-based booklet for students’ career counseling (limited in its outreach, to our knowledge). Three out of the six sections in this booklet are to some extent based on RIASEC. We refrained from using the test already developed by the NEA and instead opted for a version better tailored to our context.

We designed new test statements which are activity-based (e.g. “I like hiking”) and related to students’ life in rural areas. We then ran two pre-tests and two pilots to make sure students understood the statements, as well as the link between their answers and the test results. However, we took advantage of the fact that the NEA already allocated many occupations to their respective personality types. For missing occupations, we used international allocations to personality types. We added detailed descriptions for a total of 18 jobs. All of them were carefully selected to avoid any bias regarding gender or undesirable jobs. We chose three jobs per type depending on the required educational level: finishing grade 9, finishing high school, or finishing a university degree. The selected jobs are shown in Table 1.

The overall structure of the ICET is visualized in Table 2. The application was only programmed in Khmer, therefore all following screenshots are also in Khmer. The English wording is available in Appendix C. The ICET starts with three different tests to keep students engage, limit fatigue, and obtain several measures of the students’ interests. After finishing the tests, the personalized results are displayed to each student. These include all six personality types, ordered based on the test answers. Each type can be clicked on for

further explanation.

After the test results on the students' personality types, students are shown the 18 jobs from Table 1 in random order. Students are asked to choose between zero and three jobs among these unframed selection. Then they are directed to the final component of the application, that shows the same 18 jobs again but ordered in accordance with the Holland Code ("framed career options"). Students can read in detail each job description, within or outside their strongest type. Because of this design choice we are able to disentangle the effect of receiving feedback from the effect of simply going through the application.

The exact procedure of the application starts with a login and a short introduction. Then students are shown the first page of test 1 (see Figure B.1). On the top of each relevant page, there is a robot icon reminding students that they can read detailed instructions any time.

Test 1 comprises five similar pages with a total of 30 items. Each item consists of two opposing statements and each statement is allocated to a specific personality type. Each personality type is contrasted to all other types twice across the items. Therefore, the maximum of points one personality type can get in test 1 is 10. For example, when contrasting the artistic type with the social type, the wording was "Designing an original or new equipment that my school needs such as new colorful rubbish bins or desks" versus "Tutoring students who have problems in their studies". Students are forced to choose which statement they most agree with for every item, and are not allowed to change their mind once they proceed to the next page. This test procedure is based on the work of Athanasou (2000, 2007), but we use context-relevant statements and include hand-painted pictures from a local artist for better understanding.

After filling out all five pages, students are introduced to test 2, which consists of 42 activity-based statements related again to the six types. Students choose a statement by ticking on it. The template for this test is drawn from a cooperation between the Hawaii Department of Education and the Occupation Information Network (O*NET) (Hawaii Department of Education, 2020) and it has been in use worldwide for at least a decade, although most users are located in Hawaii or in the United States. We include this test because it has been internationally validated (although not for Cambodia).

To the best of our knowledge, the format of test 3 has not been implemented prior to this study. We decided to include it after discussing appropriate formats for ninth-graders with local experts. It consists of five different scenarios, on five separate pages. Each scenario starts with a half-sentence describing a particular situation. Students are then shown six different options of how the sentence could be completed. Each option is related to a specific personality type and can be given up to three points. Students can (1) choose three different

options, thus giving one point each, or 2) choose two options such that one receives two points and the other only one point, or 3) choose a single option by allocating three points to it. Students are not allowed to change their choices once they proceed to the next page. Figure B.3 illustrates the first scenario and shows in addition that each scenario is supported by a hand-painted picture from a local artist.

After completing the three tests, the students are forwarded to the page of results, which displays the six personality types of RIASEC. For each personality type, the students' choices in each test are counted separately. In test 1, points are allocated to personality types depending on the opposing statement chosen by the students. In test 2, a type is given points whenever the students ticks its related statements, with a maximum of seven points. Finally, in test 3, the points allocated to the same personality type can sum up to a maximum of 15.

The three strongest personality types are shown from left to right in the first row and visually highlighted, while the three weakest types are in the second row (see B.4). Furthermore, students also are displayed their final score for each type. We normalize the highest score to 100 and show the scores of the other types as percentages of the highest score. Relative score are additionally visualized via bars. For all types, the keyword (e.g., "realistic") is included, as well as a very short description. Students have the option to click on every one of the six personality types to read more about each type's description. The content of the descriptions is inspired by the Delaware Departement of Labor (2019) and is again adapted to the rural Cambodian context.

Based on data from two pilots, our goal was to increase variation across interests and across tests, so to pick up differences in types. Therefore, we set the scoring algorithm as follows. Test 3 is given the highest weight, entering the formula with half of its score. Test 2 is divided by a factor of 2.5, while test 1 by a factor of 20.

In the unframed job selection, the 18 jobs from Table 1 are displayed in random order and visualized by pictures from which students can choose. We include jobs with different educational requirements. A grade 9 diploma is the lowest requirement and applies to all jobs. The next level requires a high school diploma and the highest level a university degree. Therefore, students are shown jobs per personality type, each with a different educational level. We include the most common jobs students chose in our pre-study in July 2019: police officer is the job with the lowest educational requirement for the realistic type, secondary-level teacher is the job with the highest educational requirement for the social type, and general practitioner is the job with the highest educational requirement for the investigative type. Figure B.5 shows an example of the randomized display. No information with respect to the types or educational level was disclosed at this stage. Students were told to choose

up to three jobs from this selection, with an opt-out option in case they didn't find any job to be interesting.

The app concludes with the framed career options. Students are shown again the very same jobs as described before, but this time in the order of their personality types. The first row displays, from left to right, their best fit according to their strongest types, starting with the job with the lowest educational requirement and finishing with the one with the highest educational requirement. All 18 jobs are displayed at once and students have 17 minutes in total to choose which descriptions they want to read. Each description is set up by our team and gives an overview of the activities related to the job, highlights the most important tasks and responsibilities as well its societal value, and ends with an explanation of the educational requirements. An example of one job description, in this case agricultural technician, can also be seen in Figure B.6b.

Once the students click on an occupation, a pop-up window with a very detailed description appears. A timer is visualized as a green bar diminishing as time runs by and eventually turning yellow and red in the last couple of minutes. Nevertheless, students have the possibility to log out at any time before the timer runs out. The outlay of the overview page is presented in Figure B.6a.

Figure B.1: Screenshot of Test 1

ផ្នែកទី 1
ផ្នែកទី 2
ផ្នែកទី 3

(សូមចុចលើរូបខ្ញុំដើម្បីអានការណែនាំក្នុងការឆ្លើយម្តងទៀត)

7. <input type="radio"/>	<p>ចរចារតម្លៃដើម្បីទិញត្រីកង់នៅក្នុងផ្សារ</p>		ឬ	<p>សរសេររាយបញ្ជីអំពីការងារដែលត្រូវធ្វើ</p>	
8. <input type="radio"/>	<p>គូរគំនូរទេសភាព អាគារល្បីៗ ផ្ទះ ឬមនុស្ស</p>		ឬ	<p>ការប្រកួតប្រជែងខ្លួនឯងជាមួយនិងមុខវិជ្ជាថ្មីៗនៅសាលា</p>	
9. <input type="radio"/>	<p>តាមដានការចំណាយគ្រួសារ និងត្រួតពិនិត្យឲ្យប្រាកដថារាល់វិក័យប័ត្រត្រូវបានបង់</p>		ឬ	<p>ការចិញ្ចឹម (អោយចំណី និងមើលថែរក្សា) សត្វ</p>	
10. <input type="radio"/>	<p>ស្វែងយល់ពីមូលហេតុដែលបាក់របស់អ្វីមួយនៅសាលា</p>		ឬ	<p>ផ្តល់បទបង្ហាញអំពីកិច្ចការសាលាណាមួយរបស់ខ្ញុំទៅសិស្សទាំងអស់ក្នុងថ្នាក់</p>	
11. <input type="radio"/>	<p>រៀនពីរបៀបពន្លត់អគ្គីភ័យ (ឧ: ភ្លើងឆេះផ្ទះ ឆេះវាលស្រែ ។ល។)</p>		ឬ	<p>រចនាអ្វីម្យ៉ាងដែលមនុស្សស្មើស្ម័គ្រចង់បានគិតឃើញពីមុនមក</p>	
12. <input type="radio"/>	<p>សហការជាមួយមិត្តរួម ថ្នាក់ដើម្បីពិភាក្សាពីវិធីធ្វើឱ្យថ្នាក់រៀនមានសភាពល្អ (ឧ: ស្អាតនិងមានអនាម័យ)</p>		ឬ	<p>រៀបចំបន្ទប់, ផ្ទះ ឬថ្នាក់រៀនរបស់ខ្ញុំមានឲ្យសណ្តាប់ធ្នាប់និងអនាម័យ</p>	


20 %

2/5
ទំព័រចម្លង →

Notes: The application was programmed only in Khmer.
The English wording is available in Appendix C.

Figure B.2: Screenshot of Test 2

ផ្នែកទី 1
ផ្នែកទី 2
ផ្នែកទី 3


(សូមចុចលើរូបខ្ញុំដើម្បីអានការណែនាំក្នុងការឆ្លើយ)


1. ខ្ញុំចូលចិត្តពិនិត្យទើលស្វែងយល់ ជួសជុលម៉ូតូ
2. ខ្ញុំចូលចិត្តលេងល្បែងផ្លូវប
3. ខ្ញុំពូកែធ្វើការដោយឯករាជ្យខ្លួនឯង មិនចាំបាច់មានការណែនាំច្រើន
4. ខ្ញុំចូលចិត្តធ្វើការជាក្រុម
5. ខ្ញុំជាមនុស្សមានមហិច្ឆតាខ្ពស់ ហើយខ្ញុំកំណត់គោលដៅសម្រាប់ខ្លួនឯង
6. ខ្ញុំចូលចិត្តរៀបចំរបស់ផ្សេងៗ (ឯកសារ តុ ឬ បន្ទប់ការិយាល័យ)
7. ខ្ញុំចូលចិត្តការសាងសង់ (ឧ: ធ្វើទ្រុងមាន់ទា រងទ្វះឬបង់ព័ទ្ធជុំវិញសាលារៀន)
8. ខ្ញុំចូលចិត្តអានអំពីសិល្បៈនិងកម្រី
9. ខ្ញុំចូលចិត្តមានការណែនាំច្បាស់លាស់ក្នុងការធ្វើអ្វីមួយ
10. ខ្ញុំចូលចិត្តព្យាយាមខ្លួនឯងមានឥទ្ធិពល ឬអាចបញ្ចុះបញ្ចូលមនុស្សដទៃឲ្យធ្វើអ្វីមួយ
11. ខ្ញុំចូលចិត្តធ្វើការពិសោធន៍
12. ខ្ញុំចូលចិត្តបង្រៀន ឬបណ្តុះបណ្តាលមនុស្ស
13. ខ្ញុំចូលចិត្តជួយមនុស្សក្នុងការដោះស្រាយបញ្ហារបស់ពួកគេ
14. ខ្ញុំចូលចិត្តទើលថែរក្សាសត្វ
15. ខ្ញុំអាចធ្វើការ ៨ ម៉ោងក្នុងមួយថ្ងៃ នៅក្នុងការិយាល័យបាន
16. ខ្ញុំចូលចិត្តលក់របស់របរ
17. ខ្ញុំចូលចិត្តការសរសេរលក្ខណៈមានការផ្ទៃប្រឌិត
18. ខ្ញុំចូលចិត្តវិទ្យាសាស្ត្រ
19. ខ្ញុំចង់និងឆាប់ទទួលយកតួនាទី ឬទំនួលខុសត្រូវថ្មីក្នុងការងារអ្វីមួយ
20. ខ្ញុំចាប់អារម្មណ៍ក្នុងការព្យាបាលមនុស្សឲ្យធូរស្បើយ
21. ខ្ញុំចូលចិត្តស្វែងយល់ពីរបៀបក្នុងការធ្វើអ្វីមួយដំណើរការ

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ទំព័រចម្លង →


Notes: The application was programmed only in Khmer.
The English wording is available in Appendix C.

Figure B.3: Screenshot of Test 3

ផ្នែកទី 1
ផ្នែកទី 2
ផ្នែកទី 3


(សូមចុចលើរូបខ្ញុំដើម្បីអានការណែនាំក្នុងការឆ្លើយ)

ព្រឹត្តិការណ៍ទី១៖
 គ្រូរបស់ប្អូនកំពុងស្វែងរកសិស្សមួយក្រុមដើម្បីជួយតាក់តែងការសម្តែងរឿងមួយ (ឧទាហរណ៍ ទុំទាវ) ដោយសមាជិកក្រុមត្រូវសម្តែងជាតួអង្គផ្សេងៗនៃសាច់រឿង និងមានតែងខ្លួនស្លៀកសម្លៀកបំពាក់ឲ្យដូចតួអង្គជាដើម។ តើប្អូនគិតយ៉ាងណាដែរ?



1. ខ្ញុំស្រលាញ់ការសម្តែង។ ខ្ញុំចង់សម្តែងជាតួអង្គមួយនៅក្នុងរឿង!
2. ដោយសារការខិតខំប្រឹងប្រែងរបស់យើង, ខ្ញុំគិតថាយើងគួរតែបង្ហាញការសម្តែងនេះ មិនត្រឹមតែនៅក្នុងសាលារៀនប៉ុណ្ណោះទេប៉ុន្តែថែមទាំងនៅទីប្រជុំជនផងដែរ។
3. ការសម្តែងនៅក្នុងសាលាគឺជាសិទ្ធិផលរបស់មនុស្សជាច្រើនដែលធ្វើការជាមួយគ្នា ហើយនេះគឺជាអ្វីដែលខ្ញុំចូលចិត្តបំផុត។
4. ខ្ញុំមិនឃើញចំណុចសំខាន់ក្នុងការចូលរួមសកម្មភាពនេះទេ។ ខ្ញុំចង់រៀនសម្រាប់ត្រៀមប្រលងវិញ។
5. ខ្ញុំនឹងសូមឲ្យគ្រូរបស់ខ្ញុំជួយផ្តល់សៀវភៅរឿង ដើម្បីឲ្យខ្ញុំបានអាន និងស្វែងរកសាច់រឿងល្អៗផ្សេងៗដែលគួរឱ្យចាប់អារម្មណ៍ដើម្បីបានជាគំនិត។
6. ខ្ញុំចាប់អារម្មណ៍បំផុតក្នុងការរៀបចំឆាកនិងត្រៀមសម្ភារៈផ្សេងៗ។

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ទំព័រចម្លង →

Notes: The application was programmed only in Khmer.
 The English wording is available in Appendix C.

Figure B.4: Screenshot of the Test Results



Notes: The application was programmed only in Khmer.

Figure B.5: Screenshot of the Job List

ផ្នែកការងារ



នៅផ្នែកនេះ ប្អូននឹងឃើញមានជម្រើសនៃការងារ ដែលសិស្សទាំងឡាយដូចជាប្អូនជាដើម អាចមាន
ចំណាប់អារម្មណ៍។ តើការងារណាខ្លះ ដែលប្អូនគិតថាគួរឲ្យចាប់អារម្មណ៍? ប្អូនអាចជ្រើសរើស
ដោយចុចលើរូបភាព ឬឈ្មោះការងារខាងក្រោមចាប់ពី 0 ទៅ 3 ការងារ។

អានបន្ត

					
វិស្វករសំណង់ ស៊ីវិល	អ្នកបម្រើការងារ សង្គម (ធ្វើការ ជាមួយអង្គការ ក្រៅរដ្ឋាភិបាល - NGO)	អ្នកសារពត៌មាន	គ្រូពេទ្យបង្អែក	មន្ត្រីថ្មីលីស	ជាងឈើ
					
ភ្នាក់ងារអចលន ទ្រព្យ	មេចុងភៅ (ម្ចាស់ ភោជនីយដ្ឋាន)	ស្ថាបត្យករ	អ្នកទទួលភ្ញៀវ	មគ្គុទេសក៍ ទេសចរណ៍	អ្នកបច្ចេកទេស កសិកម្ម
					
អ្នកផ្ទៃម៉ូដសម្លៀក បំពាក់	គ្រូ កម្រិតអនុវិទ្យាល័យ	អ្នកថតរូប	អ្នករដ្ឋបាល ការិយាល័យ	អ្នកគ្រប់គ្រងផ្នែក លក់	អ្នកបង្កើតកម្មវិធីកុំ ព្យូទ័រ

គ្មានការងារណាដែលខ្ញុំចាប់អារម្មណ៍ទេ

ទំព័របន្ទាប់

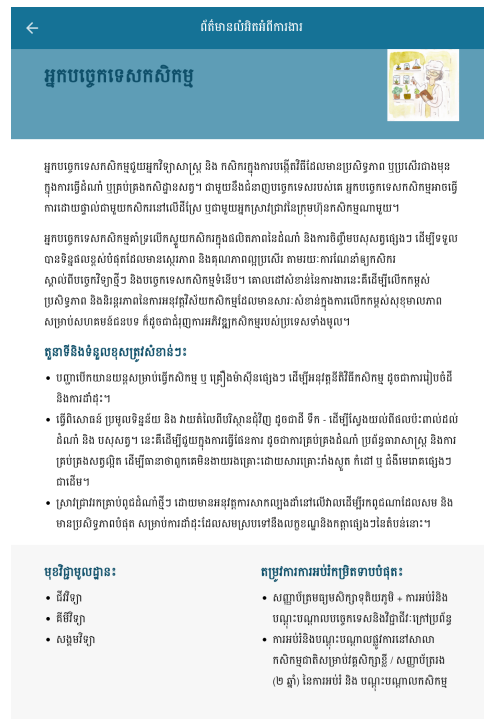
Notes: The application was programmed only in Khmer.
The English wording is available in Appendix C.

Figure B.6: Screenshots of the Career Options

(a) Overall Job page



(b) Example of one Job Description



Notes: The application was programmed only in Khmer.
The English wording is available in Appendix C.

C Wording of ICET

Interest-based personality tests

Table C.1: Wording of Test 1, personality type in parentheses

ID	Statement 1	Statement 2
t1_q1	Designing an original or new equipment that my school needs such as new colorful rubbish bins or desks (A)	Tutoring students who have problems in their studies (S)
t1_q2	Selling goods or groceries to customers (E)	Keeping records of income such as gift money from guests or expenses in events (e.g. a wedding, a religious ceremony such as “Bon Kathen”) (C)
t1_q3	Helping out a friend who is busy with lots of work to do for their family (e.g. by doing house chores, or helping with the family business) (S)	Going to the library and reading about a topic I am interested in (I)
t1_q4	Encouraging people with a positive attitude before an exam (E)	Sharing something that happened to me with others to help them learn what I learned (S)
t1_q5	Studying nature or people (I)	Growing different types of trees, plants or vegetables (R)
t1_q6	Gardening such as cutting grass or trimming bushes around my house or along the street (R)	Designing a poster that is creative and eye-catching for my school (A)
t1_q7	Negotiating prices at a local market (E)	Writing to-do lists (C)
t1_q8	Painting sceneries, buildings, houses or people (A)	Challenging myself with new subjects at school (I)
t1_q9	Keeping track of household expenditures and make sure bills are being paid (C)	Raising (feeding and looking after) animals (R)
t1_q10	Finding out why something went missing at school (I)	Giving presentation about my school assignment to the class (E)
t1_q11	Learning how to put out fires (e.g. houses/buildings or fields on fire) (R)	Designing something that other people have not thought of before (A)
t1_q12	Teaming up with classmates to discuss how to keep the classroom in a good shape (clean and tidy) (S)	Keeping my room, house or classroom clean and tidy on my own (C)
t1_q13	Entertaining my friends by telling an interesting story (E)	Understanding how the sanitation system works at school (R)
t1_q14	Solving exercises with clear instructions and ordered steps (C)	Writing an open-topic essay which I can write about anything I’m interested in (A)
t1_q15	Observing other people’s behavior to understand their emotions and how they think (I)	Convincing friends to join a social event (E)

t1_q16	Figuring out how things work/operate (e.g. bikes) by taking them apart and putting them back together (R)	Caring for people who are disabled (S)
t1_q17	Determining the best routes to travel on to get to a specific destination (R)	Collecting information into a notebook for future reference (C)
t1_q18	Weaving baskets/bamboo balls or using grass or flowers to make bracelets (A)	Explaining how a compass (instrument to draw circles) is used to convince my friends to use it, too (E)
t1_q19	Investigating the reasons for a shortage in water supply (I)	Following routines to avoid errors or mistakes (C)
t1_q20	Checking my previous lessons or textbooks to learn from past errors (C)	Learning about new topics by reading about them in school books provided by the teachers (I)
t1_q21	Setting up a school garden such as adding the soil and grass, planting flowers, etc. (R)	Connecting with my community by learning about their problems (S)
t1_q22	Writing a song or a poem for someone I like (A)	Promote tourist attraction sites to visitors (E)
t1_q23	Understanding what happens during a lunar eclipse (e.g. by asking my teachers or older people about it) (I)	Telling interesting stories to the elderly (S)
t1_q24	Being in charge of looking after a relative's (grocery) store and serving customers in her absence (E)	Going for a hike in the mountains/forests to collect firewood, pick fruits or find natural herbal medicine (R)
t1_q25	Creating artistic advertisements for products sold in a store or sold by your parents (A)	Recording other student test scores for the teacher after an exam or for Student Report Book (C)
t1_q26	Making new friends during a social event in the neighboring village (S)	Memorizing and performing a dance you saw on TV or during a social event (A)
t1_q27	Organizing traveling arrangements such as food, accommodation, and places to visit (C)	Listening to people sharing stories (S)
t1_q28	Learning to play a musical instrument (e.g. a guitar, flute, drum) (A)	Analyzing the reasons why a mobile phone, TV or radio is not working (I)
t1_q29	Teaching children how to play sports (S)	Taking up a leadership role in a group project (E)
t1_q30	Collecting and analyzing natural resources such as fossils or minerals (I)	Learning how to fix everyday items such as broken shoes, bags, fans, etc. (R)

Table C.2: Wording of Test 2

ID	Wording	Type
t2_q1	I like studying and tinkering with motorbikes	R
t2_q2	I like to do puzzles	I
t2_q3	I am good at working independently	A
t2_q4	I like to work in teams	S
t2_q5	I am an ambitious person, I set goals for myself	E
t2_q6	I like to organize things, (files, desks/offices)	C
t2_q7	I like to build things (e.g. making chicken/duck coop, fences around the house or around the school)	R
t2_q8	I like to read about art and music	A
t2_q9	I like to have clear instructions to follow	C
t2_q10	I like to try to influence or persuade people	E
t2_q11	I like to do experiments	I
t2_q12	I like to teach or train people	S
t2_q13	I like trying to help people solve their problems	S
t2_q14	I like to take care of animals	R
t2_q15	I wouldn't mind working 8 hours per day in an office	C
t2_q16	I like selling things	E
t2_q17	I enjoy creative writing	A
t2_q18	I enjoy science	I
t2_q19	I am quick to take on new responsibilities	E
t2_q20	I am interested in healing people	S
t2_q21	I enjoy trying to figure out how things work	I
t2_q22	I like putting things together or assembling things	R
t2_q23	I am a creative person	A
t2_q24	I pay attention to details	C
t2_q25	I like filing / organizing previous lessons or teachers' handouts according to school subjects	C
t2_q26	I like to analyze things (problems/situations)	I
t2_q27	I like to play musical instruments or sing	A
t2_q28	I enjoy learning about other cultures	S
t2_q29	I would like to start my own business	E
t2_q30	I like to cook	R
t2_q31	I like acting in plays	A
t2_q32	I am a practical person	R
t2_q33	I like calculating numbers or drawing graphs to better understand a problem description in a lesson	I
t2_q34	I like to get into discussions about issues	S
t2_q35	I am good at keeping records of my work	C
t2_q36	I like to lead	E
t2_q37	I like to be and work outside in nature, fieldwork in different villages or work on different project sites	R
t2_q38	I would like to work in an office	C
t2_q39	I'm good at math	I
t2_q40	I like helping people	S
t2_q41	I like to draw	A
t2_q42	I like to talk in front of the villagers to explain solutions to problems we have in the village	E

Table C.3: Wording of Test 3

ID	Wording	Type
	Scenario I: Your teacher is looking for students to help her with an acting performance of a story (e.g. Tum Teav) with a group of people playing different characters of the story, wearing costumes, etc. What do you think?	
t3_q1.1	I love plays. I would like to play a character in the story!	A
t3_q1.2	Given how much effort we put in, I think we should show the play not only in school but in the district town.	E
t3_q1.3	The school play is a product of many people working together, this is what I like most about it.	S
t3_q1.4	I do not see the point in doing the play; I would rather prepare for my exams.	C
t3_q1.5	I'll ask my teachers to provide story books, so that I could read and search for interesting plays.	I
t3_q1.6	I am most interested in setting up the stage and putting pieces together.	R
	Scenario II: When I have a problem at school and feel worried, I would most likely do the following:	
t3_q2.1	I can reduce stress by listening to music, singing, dancing, painting or drawing.	A
t3_q2.2	I would distract myself by helping my parents with the household, in the garden, or on the farm.	R
t3_q2.3	I usually find ways to overcome my problems, they help me grow.	I
t3_q2.4	I would talk to my friends or family. Talking to people always helps me.	S
t3_q2.5	I would not let myself down too much, usually things work out.	E
t3_q2.6	I would seek help and guidance from my teacher.	C
	Scenario III: I prefer when new lessons in class are ...	
t3_q3.1	... well ordered and organized with clear information. I like to know which exercises I have to complete in a day in order to prepare for the lesson.	C
t3_q3.2	... unexpected. I need surprises to be happy and excited at school.	A
t3_q3.3	... conveyed through discussions and interactions with my friends and teachers.	S
t3_q3.4	... practical. I enjoy learning things that I can apply in my daily life.	R
t3_q3.5	... challenging. I like to find answers to complex questions.	I
t3_q3.6	... giving me the option to compete with others in group exercises.	E
	Scenario IV: Your family is planning a big wedding. What would be your role in the preparation?	
t3_q4.1	I would set up the tent and tables, or help in the kitchen.	R
t3_q4.2	I would look up the best venue, caterer, or wedding dresser/make-up artist.	I
t3_q4.3	I would enjoy preparing the decoration or being the photographer of the day.	A
t3_q4.4	I would welcome everybody on arrival and make sure that the guests are comfortable.	S
t3_q4.5	I would contact my relatives and friends and convince them to come to the wedding.	E
t3_q4.6	I would be keeping record of who is coming, in order to plan the menu and seating.	C
	Scenario V: Suppose a NGO comes to your school and wants to organize a workshop day. The NGO asks you about topics you are interested in. What workshop would you suggest?	
t3_q5.1	I would like to learn how world maps/map of Cambodia are constructed.	I
t3_q5.2	I would like to learn about how to keep track of my expenditures and how to organize my homework.	C
t3_q5.3	I would like to learn games and activities that I could do with children from my village.	S
t3_q5.4	I would like to have a creative workshop that involves acting, singing, drawing, or writing.	A
t3_q5.5	I would like to learn more about how to motivate and guide my peers.	E
t3_q5.6	I would like to learn about using and repairing cellphones.	R

C.1 Wording of job descriptions

Police officer

A Police Officer (Policeman/Policewoman) is employed and trained under the government through Cambodian National Police, Department of Ministry of Interior. He/she has the duty to serve the general public and protect it against crimes, violence or any act of injustice. Another primary function is maintaining public order and peace through law enforcement and surveillance of the public to make sure they do not break the law.

Police Officers are trained to defend themselves and the victims, and are trained in investigation techniques to prevent and detect crimes such as fraud, rape, murder, or drug trafficking. They have the legal authority to arrest or detain people for a limited time when those people have been suspected of committing a crime or if there is any assault. They are also skilled at de-escalation of stressful situations between different parties.

Main Roles and Responsibilities:

- Manage traffic flow to keep the roads free of congestion, enforce the Rules of the Road for every transport user, and prevent or protocol accidents in order to maintain traffic safety and efficiency on the roads.
- In maintaining public order, police officers may patrol on foot, in a car/motorbike or are often stationed next to the road to deal with traffic violations such as giving people warnings or issuing fines.
- Receive calls to investigate burglaries or other crimes.
- Help collect evidence to solve crimes such as by investigating or interrogating suspects/criminals and witnesses to make sure the evidence is accurate and reliable before making any arrest or release.

Foundation Subjects:

- Khmer Literature
- Sociology
- Law
- History
- Physical Education

Basic Education Requirement: Lower Secondary Education + Training at The Police Academy of Cambodia

Agricultural technician

An Agricultural Technician helps scientists and farmers develop effective or better ways to manage plant and animal farms. With his/her technical expertise, an agricultural technician might work directly with farmers on the fields or with researchers of agricultural companies.

Agricultural technicians support farmers in improving productivity of different crops and livestock to maximize yields, in achieving better quality and stable production through the introduction of new technologies and sophisticated farming techniques. A key goal of this job is to improve the efficacy and sustainability of agricultural practices, which is essential to promoting well-being for the rural communities as well as advancing the nation's agricultural development as a whole.

Main Roles and Responsibilities:

- Operate farming vehicles or other motorized equipment to carry out farming procedures such as land preparation and cultivation.
- Collect samples and evaluate how the surrounding environment - e.g. soil, water - affects crops and livestock. This is necessary to improve crop management, irrigation systems, and pest control to ensure crops and livestock are not vulnerable to drought, heat, diseases, etc.
- As the executive arm of researchers, they research new crop varieties by performing planting experiments on the field to find those that are most suitable and most effective for cultivation with the conditions of the area.

Foundation Subjects:

- Biology
- Chemistry
- Sociology

Basic Education Requirements: High School Diploma + Non-Formal Technical and Vocational Education and Training (TVET);

Formal education and training at National Agricultural schools for Short Courses / Associate Degree (2 years) of Agricultural Education and Training

Civil engineer

A Civil Engineer is a person who designs, improves, and maintains construction projects such as roads, bridges, dams, water supply or sewage systems and works on structural components of buildings e.g. airports and hospitals. With the application of their scientific and environmental knowledge, he/she also oversees the operations and progress of the projects, making sure infrastructure meets basic human needs such as withstanding all weather conditions, to promote safety and improve quality of living of citizens benefiting from these constructions.

Civil Engineering is a versatile job because different projects can translate into working in different provinces/countries and during different working hours. Also, one can see the results at the end of their work - a completed bridge, a hydroelectric dam for the community to use, etc.

Main Roles and Responsibilities:

- Designing the structure of a project and planning the construction activities
- Before the implementation can begin, civil engineers have to organize and carry out logistical tasks to ensure the project site can be reached by heavy machinery and has access to water, electricity etc.
- Perform building inspections after the project has been completed
- Ensure each construction project complies with legal requirements, especially health and safety. This is by maintaining the quality of air, water, and land through sustainable practice and methods such as by implementing strategies to deal with pollution, waste management, etc.

Foundation Subjects:

- Maths
- Physics
- Drawing
- Social Science

Basic Education Requirement: Bachelor's Degree in Civil Engineering

Carpenter

Carpenters are skilled craftsmen and women who create or adjust wooden objects and structures. In the construction industry, carpenters can work on different project sites from building homes and offices to bridges and roads. They need to start by reading and analyzing technical drawings or blueprints to understand the layouts and details of building plans and determine what they need to construct.

Their expertise in constructing wooden frames is fundamental to support building structures and ensure sustainability in each construction. This is why they need both training and physical practice to excel in making objects such as wardrobes, cabinets, chairs, and beds or structures such as houses or boats important and necessary for everyday use. In doing so, they need to be detail-oriented to be able to perform fine, intricate work accurately.

A carpenter may work independently or in teams based on the project contracts, but prefers little supervision as it is important that they make decisions and try out designs on their own.

Main Roles and Responsibilities:

- Make precise measurements of sizes and distances, calculate quantities and angles, triangulation, etc., before/while cutting or shaping wood, plastic or other materials.
- When facing unexpected situations or errors, carpenters need to think and come up with solutions quickly and accurately. They need to use logic to foresee problems/challenges in order to ensure effective time and budget management in a project.
- Communicate with clients and arrange what amount and type of materials and fitting plans according to the clients and building needs.

Foundation Subjects:

- Mathematics (Arithmetic, Algebra, Geometry)
- Drawing
- Physics
- Social Science

Basic Education Requirement: Lower Secondary Education + Technical and Vocational Education and Training (TVET) - Carpentry Training / Apprenticeship

Journalist

The primary function of this profession is to investigate different social issues, which can be to provide insights into global events that can have impacts on people's lives or to uncover crimes, political corruption or corporate wrongdoing, etc. In this process, journalists then collect, write, and present information they manage to obtain as news stories. The news can be presented through newspapers, radio, magazines, television, and the internet.

A journalist can work with general issues, but the majority tends to specialize in certain topics of their highest interest or expertise such as politics, crime, business, health, or sports, etc. Regarding work setting, some journalists may be employed under national/international news organizations, or work as freelance to write news stories to different clients.

Serving to bring the truth to the general public, journalists sometimes have to expose themselves to danger with their access to sensitive information, especially when investigating and reporting in countries where freedom of the press is limited. However, through their essential role of being the eyes for the public, the world's citizens are informed about what they need to know - important issues that can help them make the best possible decisions about their lives, their communities, societies, and governments.

Main Roles and Responsibilities:

- Educate the public in an accurate, well-rounded, and objective manner about national and/or international events and issues and how they can affect lives of the citizens.
- Collect information for each news story, which can be by interviewing expert sources/witnesses on the topic, researching public/private records for facts and statistics to support their stories, visiting the sites of where the focal event/issue takes place, and documenting what they see, etc.
- Present the information they have collected in written or spoken form as news stories, documentaries or featured articles.

Foundation Subjects:

- Khmer Literature
- History
- Sociology
- Social Science
- Computer Skills

- Foreign Language (English)

Basic Education Requirement: High School Diploma + Media Training (e.g. Cambodian Center for Independent Media)

General practitioner

A General Practitioner works in and for a particular community in public health facilities such as a referral hospital. He/she may also choose to work in provincial or major hospitals across the country.

In health care, general practitioners are primary-care physicians whom patients of all ages can go to for diagnoses, minor surgeries, and especially for treating ailments and chronic illnesses. They are the first contact when medical issues arise and consequently need to investigate in detail the type of illness and what treatment is needed. In case of serious diseases, they would need to refer those patients to the appropriate specialist doctor for medical advice and for higher-complexity surgeries or treatments.

Having the option to work close to rural communities, general practitioners can provide great convenience and comfort to remote villagers who wouldn't need to travel long distances to be admitted to healthcare. General practitioners are able to help those in need with their ability to conduct life-saving surgeries/treatments and heal people to good health and well-being.

Main Roles and Responsibilities:

- Provide patients interpretations of symptoms in identifying a certain illness, and consultations on the following course of action for treatment and medication, etc.
- Conduct physical examinations on patients to confirm a diagnosis.
- Provide pre-hospital treatment, surgeries, and other emergency care.
- Advise community members of preventive medicine and healthy lifestyles.

Foundation Subjects:

- Biology
- Chemistry
- Physics
- Mathematics

- Foreign Language (e.g. English, French)

Basic Education Requirement: Bachelor of Medicine Bachelor of Surgery

Photographer

Taking pictures as a profession, a Photographer focuses on the art of making photographs with a digital or film camera.

Photographers can be employees of corporations such as newspaper/magazine companies, fashion publication or advertising agencies, who work full-time to take pictures for business websites and other promotional materials. However, many tend to work freelance, and can be hired by different clients for specific events such as weddings or graduations. Consequently, their social impact ranges from letting hosts and invitees refresh their memory of a private event to documenting historical, political or social milestones for the general public.

Depending on their specialization, some photographers work in studios, while others work outside, exploring and capturing nature, landscapes, places and things.

Main Roles and Responsibilities:

- Work with natural/artificial lighting or colors, and may also include different props to apply creativity and aesthetics when taking pictures of people, places and things.
- Choose their own subjects or materials that they want to take pictures of, and determine what beauty and style is for that setting.
- Have the pictures taken developed physically/digitally, usually after some editing of those pictures.

Foundation Subjects:

- Arts Education
- Chemistry
- Information and Communications Technology

Basic Education Requirement: Lower Secondary Education + Vocational Training - Photography

Clothes designer

A clothes designer makes clothing for men, women and children such as suits, trousers, dresses, and other types of clothes. The clothes designed by a professional can be practical and useful for daily activities on the one hand while they can be as extravagant as wedding dresses on the other hand. The process of making clothes can involve customization to best fit each client's preferences and physique, which requires the clothes designer's talent in translating the wants of customers by using yarns and fabrics and by applying design and aesthetics to clothing.

Clothes designers can work full-time alone or part of a team for a fashion/design house. There are also those who work freelance for their own business at home or a shop.

Main Roles and Responsibilities:

- Measure customers before getting to sewing to make sure the clothing will fit and help customers select fabric and colors for their clothes. The designer communicates consistently with clients throughout the process in order to make sure all components from concept and design to materials are used to satisfy the clients.
- Sketch designs on paper/computer or drape fabric on a mannequin using different tools such as chalks, scissors, pins, and sewing machines. In designing, they also work with a wide range of materials, colors, patterns, and styles.
- Conduct research on current fashion trends to understand consumer tastes. This sets the foundation to creating designs.

Foundation Subjects:

- Drawing
- Sewing and Textile
- Arts Education
- Mathematics (Arithmetic, Algebra)

Basic Education Requirement: High School Diploma AND/OR Vocational Training - Tailoring / Dress Making

Architect

An Architect's job is to plan, design, and review the construction of buildings for clients. He/she is responsible for the visual appearance of a building, focusing on the aesthetics and

functionality of entire structures. An architect also oversees the project and is accountable for the public safety of the construction. As construction methods become more and more sophisticated, an Architect needs to ensure that s/he is up to date and offers cost-efficient and environment-friendly solutions to costumers.

With a variety of roles, architects usually work in a multitude of workplaces. During the designing stage, they may work from their office while having meetings with clients in different settings. Once the construction starts, architects need to do frequent site visits to oversee the project.

Main Roles and Responsibilities:

- Design proposals, featuring their creative ideas and visions of the clients on the structure and use of space, etc.
- Produce detailed drawings from the design and test the feasibility of the design with technology from a computer software.
- Translate the design into instructions and technical specifications for contractors and construction experts.
- Consult with engineers, construction surveyors, and other specialists about the design to ensure aspects such as structural supports and energy efficiency components e.g. ventilation system and natural lighting.

Foundation Subjects:

- Physics
- Mathematics (Algebra, Calculus, Geometry)
- Drawing
- Information and Communications Technology

Basic Education Requirement: Bachelor of Architecture

Tour guide

A Tour Guide provides information and assistance to international individual clients or groups of visitors or tourists at different travel destinations such as nature attractions, landmarks, religious/historic sites, museums or other scenic locations.

Often employed under travel companies, tour guides may offer to lead walking tours, bus tours, and also river tours on boats. With their knowledge and expertise on the history of

the target location, a tour guide normally provides interesting description and facts of the site - its history and its impacts on modern society, etc.

Main Roles and Responsibilities:

- Enlighten and engage the visitors with the site with the tour guide's knowledge of history and ability to interpret the cultural/natural heritage and provide answers to questions of interested visitors with ease
- Entertain the visitors
- Provide safety regulations and ensure that every visitor complies to the rules While also ensuring that the tour is as safe as possible for every member of the group tour.
- Plan, manage, and supervise itineraries, ensuring the program and its activities are adapted to the visitors' taste and are carried out according to schedule, arranging transportation between the traveling destinations, etc.

Foundation Subjects:

- Foreign Language (e.g. English, Chinese, Korean)
- History
- Social Sciences

Basic Education Requirement: Lower Secondary Education + Vocational Training (Post Grade 9)

Social worker (working with NGO)

A social worker chooses as his/her profession to help and empower other people or communities (usually the marginalized/disadvantaged) to enhance their well-being and promote social change, development, and cohesion.

The structure and administration of organized social work usually aims to develop the beneficiaries' knowledge, skills and ability to utilize their own, the community or government's resources. This is often by ensuring the marginalized people access to quality education, counseling, health care services, and so forth, thereby jointly developing perspectives and qualifications to improve their own life and contribute to inclusive and sustainable development.

Through addressing challenges of individuals and communities, social workers may work to tackle broader issues of human rights, poverty, unemployment, inequality, etc.

Main Roles and Responsibilities:

- Travel to rural areas or marginalized communities where the Social Workers engage and listen to the community/beneficiaries in meetings and discussions to negotiate and formulate an action plan as program/project to tackle those challenges to secure funding and support for the project to take place.
- Carry out the project implementation, with close engagement and counseling with the beneficiaries and the NGO to maintain the right direction.
- Monitor and evaluate by conducting on-going documentation of short-term and/or long-term goal attainment.

Foundation Subjects:

- Sociology
- Social Sciences
- Mathematics (Statistics)

Basic Education Requirement: High School Diploma + Social Welfare Services Training

Secondary-level teacher

Based in high schools (public/private), Secondary School Teachers help students of different age groups, typically from grades 7 - 12, to acquire knowledge, understanding and competence through teaching a particular subject of his/her expertise. The specialised subject can be academic, technical or vocational, which can be taught in a rotation of 3 - 6 classes per day and potentially to more than 100 students every day.

Through the educating process, a teacher is also integral in cultivating virtues, building a sense of moral framework and self-identity in students as they learn and grow into adulthood. Teaching can be a fulfilling career that can influence the future of young people and help prepare them into well-rounded individuals who can contribute to society.

Main Roles and Responsibilities:

- Share with students knowledge relevant to the focal subject in an understandable and interesting way
- Design lesson plans - guides which normally outline the objectives of what and how the students will learn/accomplish in a lesson, subject points to be covered, activities and learning materials to be used, etc.
- Grade students' examination papers, homework or assignments.

- Communicate with parents or guardians of the students of progress or challenges the students may have.

Foundation Subjects:

- Sociology
- Social Sciences
- Communication Skills
- (Depends on the focal subject one wishes to teach as featured in the National Curriculum, which can include Khmer Literature, Maths, Physics, Chemistry, Sociology, History, Geography, Foreign Language (English), etc.

Basic Education Requirement: Bachelor of Education

Chef (restaurant owner)

Working as a professional cook, a chef prepares, cooks, and presents food to customers, usually specialized in a particular cuisine such as Khmer, Thai, Indian or Japanese. A chef is responsible for defining her/his own responsibilities which can vary widely depending on range of tasks and the size of the restaurant. The following tasks are either carry out by the chef or need to be delegated: cooking, leading staff, bookkeeping, cleaning, advertising etc.

Two of these tasks are often performed by the chef her-/himself: cooking and leading staff. Being the head of the kitchen, he/she may innovatively develop recipes to improve the tastes or presentation of traditional dishes, or be adventurous to create new and unique dishes to produce the best possible food and put together an attractive menu that fit the customers' tastes. A chef also needs to be a leader who can supervise and delegate tasks to staff in the kitchen effectively in order to organize and achieve tasks as fast and efficient as possible to satisfy the client.

Main Roles and Responsibilities:

- Prepare, season, and decorate meals and dishes based on each customer's order.
- Work with multiple tasks, different ingredients for different dishes and various kitchen equipment
- Monitors and supervises the preparation and administration of cooking by other kitchen staff members.

- Ensure that the kitchen is well-organized and consists of a standardized level of hygiene to maintain food safety standards.

Foundation Subjects:

- Mathematics (Basic Numeracy Skills)
- Sociology
- Social Sciences

Basic Education Requirement: Lower Secondary Education + Vocational Training - Culinary

Real estate agent

Purchasing a piece of property such as a house can be an important decision to make and may involve a complex procedure to follow to get the task sorted. Therefore, people usually seek assistance from a Real Estate Agent, whose job is to help clients buy or sell properties such as houses, offices or plots of land for the best possible price and/or conditions.

A real estate agent can choose to work as a listing agent to help clients sell properties, or as a buyer's agent to help clients buy properties. With their knowledge on local property law and expertise to market properties, real estate agents act as the middleman between the two parties who wish to buy and sell properties. Once the buyer and the seller came to an agreement and accepted a bid, the agents can still be involved in supporting the clients with paperwork, ensuring communication between the two parties runs smoothly and providing feedback on inspections and moving.

The workplace may vary across time spent in an office and time spent to visit properties and have meetings with clients in different places. Real estate agents also work irregular hours, which can be during the day, in the evening or also on weekends.

Main Roles and Responsibilities:

- Conduct research to be informed of the local property market trend and competitive prices
- Look for properties that suit clients' needs.
- Negotiate on client's behalf for the most reasonable price or favorable terms.
- Attend conferences and/or seminars to stay up to date with current trends and network with property owners, potential clients, and other real estate agents.

Foundation Subjects:

- Mathematics (Arithmetic, Statistics)
- Sociology
- Social Sciences

Basic Education Requirement: High School Diploma

Sales manager

Usually employed at for-profit corporations, a sales manager leads and guides a team of sales staff to ensure effective sales processes and achievements. Sales management involves developing a sales plan which sets the strategy and identifies profit-based sales targets in order to achieve objectives through the sales of products and services in the organization. Their tasks often vary with the size of the organization they work for.

Sales managers listen and respond to customers' preferences to remain competitive and retain loyalty in the market. They also need to come up with new ideas to upgrade products and services to keep up to the evolving needs of consumers, to stay ahead and be able to expand the business's client base.

They play a key role contributing to the firm's success externally on the market but they also are a key player within the organization as a mentor and leader of employees in the sales team which are in constant exchange with the sales manager to improve their performance.

Main Roles and Responsibilities:

- Monitor and analyze customer preferences to determine the focus of sales efforts.
- Promote sales by determining discounts, special pricing plans or other rewards to capture consumers' interests.
- Evaluate sales staff performance to plan and coordinate training programs for sales staff.
- Manage and resolve customer complaints regarding sales and service.

Foundation Subjects:

- Mathematics (Arithmetic, Algebra, Statistics)
- Sociology
- Social Sciences

- Psychology
- Foreign Languages (e.g. English, Chinese)

Basic Education Requirement: Bachelor's Degree in Sales or Marketing; Bachelor's Degree in Business

Receptionist

A Receptionist (sometimes referred to as administrative assistant) is someone who performs various administrative tasks, including answering telephones and giving information to the public and customers. The work is usually performed in the waiting area such as a lobby or front office desk of an organization or business.

Receptionists are often the first employee with whom the public or customer has contact. They are responsible for making a good first impression for the organization, which can affect the organization's success.

Main Roles and Responsibilities:

- Answer and forward telephone calls, obtain or send information or documents using a computer, mail, or a fax machine, and perform other administrative support tasks, such as keeping appointment calendars
- Greet walk-in customers and other visitors and escort them to specific destinations while contributing to the security of the office by helping to monitor visitors' access
- Copy, file, and maintain documents and records plus collect, sort, distribute, and prepare mail and courier deliveries.

Foundation Subjects:

- Sociology
- Social Sciences
- Foreign Languages (English, Chinese)

Basic Education Requirement: Lower Secondary Education + Vocational Training - Hospitality

Office administrator

An office administrator works to ensure smooth flow of day-to-day operation and procedures of an office or an organization by supporting and organizing the administrative system. This includes financial arrangement and billing, personnel support, information and document records management, and logistics.

Having a key role in running various administrative activities effectively and efficiently, office administrators often need to provide and inform structures to other employees to follow such as budget management, procurement, correspondence procedure, etc. Consequently, they are good in multitasking managing various types of tasks at the same time.

Main Roles and Responsibilities:

- Coordinate office activities by implementing, managing and maintaining filing and labeling system of different categories of information records or invoices to ensure any required information is found easily and quickly when needed.
- Supervise administrative staff and assist fellow employees with meetings, conferences and other work events by scheduling appropriate times, booking rooms, and arranging refreshments, etc.
- Keep stock of office supplies and order stationery, furniture, and other office equipment when needed.

Foundation Subjects:

- Khmer Literature
- Mathematics (Arithmetics, Statistics)
- Computer Skills (e.g. Word, Excel, Access)
- Foreign Languages (English)

Basic Education Requirement: High School Diploma

Software developer

Usually in a planned and structured process as discussed with clients, software developers have a keen interest in computer systems and the latest technology who write and maintain a chosen programming language (commonly known as a collection of code / source code) to carry information and implement a sequence of instructions which automate the performance of one or multiple tasks in a software. For example, a client can request to develop a program

which controls electricity supply during the night such that light in public spaces are shut off automatically during times when nobody is present.

A software developer may work as an employee for an organization or as a freelancer and their work facilitates digital effectiveness in our daily use in a range of fields such as Health care, Education, Economics, Business, etc. He/she often works as a team with a number of computer programmers to write and implement the source code and also to find and fix errors in the system in order make changes and ensure proper function of the software.

Main Roles and Responsibilities:

- Communicate with clients to analyze their needs in order to design develop software/applications according to their requirements.
- Work with the client to create a conceptual design, and then have the developer's team of computer programmers create the programming code in order to run the software.
- Once the final manifestation and internal system of the program/software has been built, the developer continues to maintain and update the program to ensure all security problems are fixed and is well-operated in the database.

Foundation Subjects:

- Computer Skills
- Mathematics (Calculus, Statistics)
- Physics
- Social Sciences
- Foreign Languages (English)

Basic Education Requirement: Bachelor's Degree in Software Engineering; Bachelor's Degree in Computer Science; Bachelor's Degree in Information Technology