

令和 2 年度入学者選抜学力検査問題

(前期日程)

英 語

(注 意)

- 1 問題紙は指示があるまで開いてはいけません。
- 2 問題紙は本文 11 ページです。答案用紙は 3 枚あります。
- 3 答えはすべて答案用紙の指定のところに記入してください。
- 4 問題紙と下書き用紙は持ち帰ってください。

I The following passage is a newspaper article on education reform in Taiwan published in April 2019. Read the passage and answer the questions.

Taiwan Needs More Than a Few Extra Foreign English Teachers to Make Bilingual Country Ambitions a Reality.

The Ministry of Education (MOE) has announced plans this week to try and attract more overseas English teachers to work in Taiwan as part of the new policy to turn Taiwan into a fully bilingual country by 2030.

As most native English speakers who have spent time in Taiwan will testify, this is a hugely ambitious target and many would suggest that achieving it in just twelve years is unrealistic.

It is certainly fair to say that simply hiring more native English language teachers is not going to solve the problem on its own.

Taiwan is already awash with foreign English teachers plying their trade¹ at one of the numerous cram schools that line the streets around elementary and junior high schools.

There is a perception among many Taiwanese people that, to effectively teach English, you need a western appearance and not a lot else. Certainly, most do not require any kind of teaching qualification or prior experience.

While some will throw their heart and soul into their work, the truth is that many do little more than go through the motions, happy to fill a few hours of their students' time until their parents come and pick them up and the next paycheck is paid.

The average English ability of the generations of students that pass through this system is a testament to² the fact that it just doesn't work.

That is not solely the fault of the teachers, of course. Taiwanese school kids have to work for inhumanely long hours and are expected to retain absurdly large amounts of knowledge to be regurgitated³ in the frequent and extremely

stressful exams they have to sit. It is little wonder that their after-school English classes are pretty low on their priority list.

Even if we dismiss⁴ the 2030 target as unrealistic, if Taiwan is going to become a genuinely bilingual nation at any point in the future, it is the system itself that needs reform.

Many of the reforms that are needed could and should be applied across the entire educational curriculum. A move away from information retention and towards learning through doing, applying, analysis, and critical thinking is desperately long overdue⁵ in Taiwan.

To deliver this type of curriculum, Taiwan needs to switch its focus away from anyone born in the West and instead focus on hiring good, qualified, and motivated teachers from all sorts of backgrounds.

Some of these will be bilingual Taiwanese teachers, but there is still a role for foreign teachers within a reforming Taiwanese system too. After all, the only way Taiwanese education is going to move into the twenty-first century is with the help of those who already understand modern teaching styles.

Taiwan's budget for foreign teachers should, therefore, be focused on attracting highly skilled and fully qualified teachers from countries like the USA, the UK, and Australia to relocate to Taiwan and bring their skills with them.

This will mean offering salaries substantially higher than the NT\$800 an hour most cram school teachers live on. But for those higher salaries, there should come more responsibility.

As well as delivering lessons, these teachers should be tasked with helping to shape a modern new curriculum. That curriculum should deliver effective English language skills with a view to ensuring all kids that go through the system should leave with at least conversational English skills.

These new foreign teachers can also help to reshape the curriculum across

other subjects, train Taiwanese teachers, and give Taiwanese students the skills most international companies are looking for these days.

That isn't the ability to retain information and pass exams. It is the ability to think constructively, independently, and imaginatively and bring an entrepreneurial zeal⁶ into any job they do.

It will be a big reform and it will not please many people. Traditionalists who are tied to the centuries-old public service exam traditions will resist. They must be argued down.

Many public school teachers, who are comfortable with their high salary and great pension, will resist any efforts to get them to change. They should be forced to change or otherwise pensioned off⁷ and replaced with hungry new teachers who still have a passion for education rather than one eye on retirement.

Most importantly, such sweeping education reforms will take political will too. The current government has proved it is willing to show political courage and take decisions that will prove unpopular for the long-term good.

It might cost them at the ballot box⁸ in the short term, but the political will to take brave, long-term decisions is a quality not often seen but much needed by countries like Taiwan.

Certainly, it is badly needed if Taiwan is ever going to have any hope of becoming a truly bilingual country and, frankly, if it is ever going to develop an education system fit for the modern world.

(Adapted from "Taiwan needs more than a few extra foreign English teachers to make bilingual country ambitions a reality," *Taiwan News*, April 13, 2019)

plying their trade¹ : working

is a testament to² : clearly shows

regurgitated³ : repeated

dismiss⁴ : reject

is desperately long overdue⁵ : should have happened by now

an entrepreneurial zeal⁶ : business passion

pensioned off⁷ : retired with financial reward

ballot box⁸ : election

Question 1: Based on the passage, answer questions (A) to (D) in English. Your answers should not be more than 15 words each.

- (A) Where are many cram schools located in Taiwan?
- (B) What quality do many Taiwanese people think is most important when hiring foreign teachers?
- (C) What should the new curriculum focus on in Taiwan?
- (D) Who may be unhappy with the author's idea for reform?

Question 2: Which of the following is closest to the meaning of the words or phrases (E) to (H) underlined in the text?

(E) “awash”

- 1) flooded
- 2) flowed
- 3) satisfied
- 4) concerned

(F) “go through the motions”

- 1) do something happily
- 2) do something as well as possible
- 3) do nothing
- 4) do something without enthusiasm

(G) “sweeping”

- 1) overwhelming
- 2) explorative
- 3) extensive
- 4) exciting

(H) “badly needed”

- 1) needless
- 2) ill-used
- 3) instructive
- 4) essential

Question 3: With rapid globalization, people from bilingual countries such as Singapore and Malaysia have a great advantage in international communication. On the other hand, in those countries, citizens with lower English abilities are likely to have fewer job opportunities. Do you think Japan should become a bilingual country? Why or why not? Answer in 25 to 35 English words.

II The following passage is a science article on the architectural structure of the nests of African termites (ant-like insects). Read the passage and answer the questions.

Let's Mimic Termite Nests to Keep Human Buildings Cool

When it comes to building sustainable buildings, humans have a lot to learn from termites. A recent study that colleagues and I published in *Science Advances* explains how some African termites maintain cool and stable temperatures in their nests throughout the year. The answer lies in the walls of the nests, composed of tiny but highly-connected pores¹.

Today's architects and builders are continuously seeking new and improved ways to cool buildings without using more energy. In fact, growing demand for air conditioners is one of the most critical blind spots in today's energy debate—it has been projected that 10 new air-conditioning units will be sold every second for the next 30 years. As the planet warms, people will increasingly need to build sustainable buildings that do not rely on vast amounts of energy for air conditioning.

This is where termites come in. Termites—not to be confused with their distant relatives, ants—are insects with sophisticated social structures built on hierarchies: they have kings, queens, workers and soldiers. Like humans, these cockroach cousins prefer to build their own environment rather than adapting to one. For example, some termites have mastered sustainable fungus² farming which helps them digest their food. One can also find termites living in arid³ regions that may be hostile to their bodies. To counteract this harsh environment (and in some cases to sustain fungus farming) they build structures that are sufficiently cool and humid—these are the famous mounds, or nests.

For these reasons, termite nests have been widely studied as examples of effective ventilation⁴ and temperature control. Yet, exactly how they build their constructions has until recently remained somewhat poorly understood.

Some species of termites, those that do farm fungus, build towering nests that are ventilated by a complex system of tunnels and openings. These tunnels regulate the nests' ventilation the same way chimneys and windows work in a human house. In fact, a few buildings have been inspired by termite nests, such as the Eastgate Centre in Zimbabwe, which successfully uses 90% less energy than a similarly sized building next door.

But those termites that do not grow fungus build nests which appear smooth, and have no apparent openings. In spite of this, ventilation remains important for these termites. Until recently it wasn't clear how these termites were able to keep air moving around their nests to avoid suffocating⁵.

That's what colleagues and I—a team of biologists, engineers, and mathematicians in France and the UK—set out to investigate. Our research found that the tiny building blocks that make up the nest itself are optimized⁶ for these processes to occur naturally and effectively.

We focused on a non-fungus-growing species, the grass harvesting termite, and began by excavating⁷ nests we found in Senegal and Guinea in West Africa. The nests are made of soil particles⁸ mixed with water and termite saliva. Despite not having apparent openings, the walls are composed of micrometer-sized pores.

We took tiny samples from the nests and put them under a micro X-ray scanner akin⁹ to that used in hospitals—but one which is capable of scanning with much finer resolutions¹⁰. This revealed the termites build outer walls that actually contain both small pores and a series of slightly larger and interconnected pores. In fact, about 99% of the pore space was linked up.

Using the X-ray scans, we were able to build a digital version of the nests, much like the digital worlds that exist in computer games. We then simulated the nests in the conditions in which these termites live—dry in Senegal and wetter in Guinea.

We found that the links between the big pores allow air to “percolate” through the outer wall in the same way coffee is strained through a filter. This is key to ventilation and regulating temperatures.

By creating tiny ventilation passages, the pores of the nests manage gas exchange in a similar way to human lungs. But where a pair of lungs deflates and inflates to drive ventilation, in these nests the air is driven in and out by differences in temperature between the inner nest and the outside world.

We still don’t know whether termites create these interconnected pores following simple construction rules, or as a consequence of physical constraints resulting from the way pellets¹¹ of soil are packed together. But our research does suggest that it is the structure, not the material used, that is key to ventilation, especially considering that samples from the two regions are composed predominantly of different materials (sand in Senegal and clay in Guinea).

The challenge is now to derive the same design principles and scale them up for humans. No one wants to live in an exact copy of a termite’s nest, complete with fungus chambers. But learning from termites might involve creating new synthetic building materials with connected pores. It is important to remember that human ingenuity¹² allows us to not merely copy forms found in nature, but to emulate¹³ the mechanism by which such forms emerge.

(Adapted from “Let’s mimic termite nests to keep human buildings cool,” *The Conversation*, May 6, 2019)

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| pores ¹ : small holes | fungus ² : e.g. mushrooms, mold, etc. |
| arid ³ : dry | ventilation ⁴ : air flow |
| suffocating ⁵ : suffering from lack of air | |
| optimized ⁶ : most suitable | excavating ⁷ : digging up |
| soil particles ⁸ : tiny pieces of soil | akin ⁹ : similar |
| finer resolutions ¹⁰ : better quality | pellets ¹¹ : tiny pieces |
| ingenuity ¹² : technology | emulate ¹³ : imitate, copy |

Question 1: Based on the passage, answer questions (A) to (D) with one complete sentence in English. Your answers should not be more than 25 words each.

- (A) What is one of the main concerns in architecture today?
- (B) What is the difference in appearance between the nests of fungus-growing termites and non-fungus-growing termites?
- (C) What did the researchers find with a micro X-ray scanner?
- (D) What causes the air to move between the inside and the outside of non-fungus-growing termites' nests?

Question 2: For statements (E) to (I), write **T** if the statement matches the content of the passage. Write **F** if the statement does not match the content of the passage.

- (E) Termites are biologically more closely related to cockroaches than ants.
- (F) Growing fungus in the nest contributes to better ventilation.
- (G) Termites make nests using nothing but soil and water.
- (H) Water comes in through the tiny links between the pores and cools down the nests.
- (I) The construction of the nest is more important than the material it is made from.

Question 3: In different regions of the world, people have developed their own unique housing style suitable for the climate and environment. Give one example and explain its advantages in 25 to 35 English words.

III In many countries, first-year college students are required to live together in a dormitory. Do you think it is a good system or not? Give your opinion with three reasons to support it. Write your answer in 80 to 120 English words.

