

“Programming Interaction”

1. Theme Introduction

In 1946, the first computer came into use in the world.

In 1969, the Internet was born...

Now, among 7 billion people in the world, the number of netizens has exceeded 3 billion.

Information technology is changing the development of human beings in an unprecedented way, and the value of information is infinitely magnified. The amount of information, the speed of information dissemination, the speed of information processing, and the degree of applying information are all growing in a geometric progression, and computer languages become passports that connect the world.

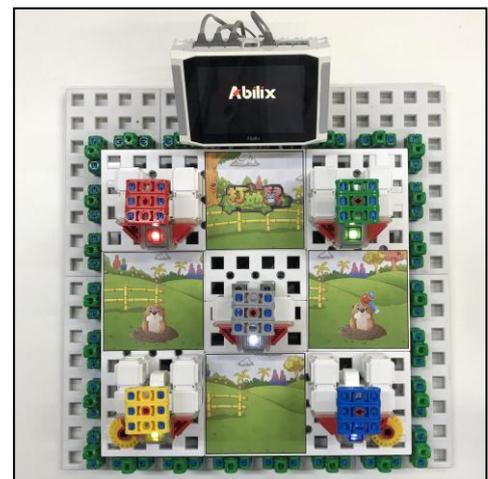
The theme of this WER educational robot invention contest: Programming Interaction, contestants should tap their potential, so that information can better server human development!

Note: The rules apply to **the primary and secondary school, secondary vocational school, higher vocational school and university contest system.**

2. Contest Venue

The WER organizing committee allocates two display tables for each participating team, and the size is about 45*120cm. The specific size is subject to the scene, please pay attention to the size of the design creative works.

Power: The display area provides 220V 50HZ power supply,



which socket may be far away from your display desk. Please prepare a long patch panel and pay attention to electricity safety.

3. Creative Works

Creativity is the rebellion for tradition, breaking conventional philosophy, a collision of ideas, a docking of wisdom, which is different from ordinary solutions.

The topic of Programming Interaction is quite broad, please design innovative works around the conception of display theme to participate in the selection , the scope of the work includes but is not limited to: Can you solve the problems encountered in your life? Is the existing solution the best? Are there any better innovative products in improving people's lives? Are there any unexplored needs in life?

3D printed parts can be used in the competition, raw materials are only allowed in plastic materials, and metal materials are not allowed. Contestants should be prepared in advance.

The entry works should include the following points:

- (1) Originality, creative discovery and problem solving;
- (2) Matching the theme of the exhibition, reflecting the connotation of the educational robot;
- (3) Emphasize the demonstration operation and application direction of the work;
- (4) Pay attention to the scientific and artistic nature of the work;
- (5) Standardize professional report and design materials.

During the competition, the exhibition will be arranged and debugged within the specified time.

The judge will score according to the scoring standard, and the contestants can introduce and demonstrate the works to the judge.

4. The Other Elements

4.1 Team Logo

The logo of the team, reflects the essence of a team.

Teams can try to design team logo for their team and print it on cards, hats, costumes, cloaks, business cards, handicrafts... let more teams know your team.

4.2 Poster

The poster is a perfect combination of pictures, text, color, space and other elements to convey information in a visual form.

Teams can design a poster with no subject matter. The craft is not limited to hand-painting, printing and collage. Note that the size of the poster should not be too large. It should match the size of the display table, and the length and width should not exceed 2mX1m.

4.3 Research Report

The research report should objectively record the work content, the design principle and design ideas of the work, the discussion process of the relevant design, the iterative process, reason and result of the plan, as well as the relevant test data, and reference materials.

4.4 Reply

The answering session is the interaction between the contestants and the judge. The contestants can introduce the source of inspiration for his work, how to solve the problem, and the idea of his own design. In this session, the judge can also ask questions to the contestants, and communicate about the work.

5.1 Team

Each team consists of 2-3 students and 1 coach (teacher or student). Students must be at the school before June 2020.

The contestants should autonomously and properly face and deal with various problems encountered in the competition with a positive attitude; self-esteem; self-respect; self-discipline; self-encouragement. Be friendly to teammates and opponents. Respect the volunteers, judge and all those who worked hard for the contest, try to cultivate yourself into a person with a sound personality and a healthy mind.

5.2 Contest System

The team will arrange the exhibition area (The WER Organizing Committee provides 2 tables with a size of approximately 45*120cm. The exact size is subject to the actual site) and prepare the exhibits within a limited time (on-site announcement). The judge will inspect each team.

Determining the venue and table number when registering on site, all contestants are required to arrange, display and dismantle according to the time announced by the WER organizing committee.

5.3 Contest Process

The members of the team took the unassembled educational robots to enter the stadium and set up their own creative display works. The judge has the right to inspect the equipment carried by teams, and the equipment which will be used must comply with the relevant regulations and requirement of the organizing committee.

6. Standard of Grading

The team's work score is composed of at least 2 expert scores in the contest and online voting. See the score sheet for details.

Online voting method: Users can scan the QR code of product packaging to download Abilix App with their mobile phones. Contestants can upload photos or videos of their robots to the Abilix App.

The criteria for judge to score are as follows:

(1) Innovative points, innovation is very important ,which means that your robot can do something that no other machine can do or doing something in a completely different way from any other machine. Contestants should clearly explain the design principle and why it is designed in this way of their works, and explain how the work is different from the others from above two aspects;

(2) Technical points, assessed from the rationality of the building structure, whether it is made ingeniously, whether the technology is properly used to solve the problem, whether the research report is strictly regulated, and whether the content is enriched;

(3) Appearance points, from the appearance integrity, aesthetics of the work, whether the on-site display is creative;

(4) Team points, from team logo, poster design and speech performance evaluation.



(Abilix App)

7. Product Model

This contest is limited to the following product models: Abilix Invention Series.

8. Awards

It is divided into primary school group, secondary school group, senior school group, secondary vocational school group, higher vocational school group and university group. For each group, there are first, second, third place and first, second and third prizes.

9. The others

9.1 During the contest, any matters not specified in the rules shall be decided by the judge committee.

The WER organizing committee entrusts the judge committee to explain and modify the relevant rules according to the actual situation of the contest, including but not limited to: the contest system, the contest time, and the task scored description.

9.2 In the contest, the judge has the final ruling. Their ruling is the final. The judge will not review the replayed video of the contest. Any questions about the judge must be presented to the chief judge by a student representative between the two contests. The organizing committee would not accept complaints from coaches or parents of the student.

10. Work Display (Whack-a-mole)

10.1 Inspiration: Due to the epidemic, people's travel and entertainment have been affected to different degrees. So I wanted to create some fun games at home.

10.2 Elements of Creation: blocks, controllers, sensors, lights, and colored paper.

10.3 The Creative Process: In the process of creation, many problems were encountered, such as the stability and completeness of the blocks, debugging of programs and application of algorithms.

Through continuous learning and summary, finally I completed the game of whack-a-mole.

10.4 Creative ideas: Through the creation of the whack-a-mole game, a lot of programming knowledge were learned, especially in logic judgment and analyzing part, not only learned a lot, but also took great pride in having fun.



Appendix 1: Scoring sheet

WER 2020 educational robot invention Contest Scoring sheet			
Number		Groups	
Team Name			

	Item	Maximum	Scores	Total
Innovation points	Whether the work is original and interesting, whether the work is original in finding and solving problems.	30		
	Project suitable for Programming Interaction topics.	15		
	Does the work consider social significance, such as pressing social issues, and the acceptability of the market?	30		
Technical points	Is the structural framework stable and the program running normally?	30		
	Whether the prototype's display effect can solve the problem found, that is, the validity of the prototype.	15		
	Whether the research report is strict and complete, whether the content is substantial, whether a complete project process is recorded: discovery problem - analysis problem - problem solving stage.	60		
Appearance points	Beautiful appearance and artistic.	15		
	Works are easy to use and correspond ergonomic.	15		
Team points	The speech is closely related to the theme, with a clear goal and a good understanding of the work.	30		
	The display board is rich in content and has a team logo.	30		
	Teamwork and cooperation spirit (can be positively faced when the problem arises).	30		
Online voting	5 points are awarded for every 50 votes, such as 5 points for 1-50 votes, 10 points for 50-100 votes. (Maximum 20)	20		
Total team scores :				

Judge : _____ **Contestant :** _____



Appendix 2: Invention Contest Log Template

1. Original Statement

I promise that this work is an original work, and the idea comes from me personally.

Signature of the inventor team

(all contestants) :

Date :

Grade :

School :

E-mail :



2. Brief Description of the Invention Process

Discover problem	Contestants can find problems to be solved from daily life and learning, as well as from television, radio and internet, and then find solutions by brainstorming and research.
	Contestants need to find out what causes the problem and what effect they have to achieve after solving the problem. The deeper the contestant understands the problem, the easier it is to find a solution.
Analyze problem	Present different solutions through brainstorming and research.
	By comparison, determine what your solution is, what the principle of the solution is, how it works.
Solve problem	Making your own prototype from a variety of materials.
	Test your own work, find its deficiencies, then correct your work, test again, and so on, until the problem is solved, and it can work properly.
	Testing also includes analyzing the pros and cons of inventions, social and environmental impacts, market and social values.
Communication	Communication means explaining problems and researching them, inventing solutions : how to solve the problem, who might use your invention, the process of creating your invention, and how to fix your own solution to make it better.

3. The Detailed Design Process

3.1 Discovery Problem Stage

- What problem do you want to solve? The more specific you are in describing the problem, the better your solution will be. How did you come up with this problem?
- What is the result you want to achieve? The more specific you are in describing the desired results, the better your solution will be.

3.2 Analyze Problem Stage

- What are the possible solutions? Which one did you choose? How did you decide which solution to try? The more specific you are in describing the solution you are about to create, the better your invention will be. How did you come up with a solution?
- Has anyone done the plan before you selected it? If so, what is the difference between your plan? Have you done any research to know that this program has been done before? Who did you communicate with? Where did you see it? Which websites did you research? You have to list 4 different pieces of evidence to prove your research, such as: communication with experts, Internet search, interviewing friends and family etc.

A.

B.

C.

D.

Contest Rule of WER 2020 educational robot invention Contest

- Draw a sketch of your model, mark all important parts and features, explain how the invention works, and attach paper if needed.

- What problems might you encounter? Does this design meet the sustainability principle? Who did you talk to this design (another student, parent, teacher, etc.)? What do they say about your design?
- How do you correct these problems?
- You can repeat the above 3 steps until you make a work that can run normally, during this period, you may have to draw a lot of sketches to get a satisfactory answer.

3.3 Solve Problem Stage

- What parts, materials and tools did you need to make inventions and how much do they cost?
- Where did you get these parts and materials?
- What additional skills or abilities do you need to complete the invention?
- Who can help you to complete these inventions?
- How did you obtain these parts and materials, then complete the invention?
- What test did you do to test and evaluate the invention?

- How did you confirm the problems of the invention works and correct them?
- Repeat the analyze and solve problem stages until you find a solution to the problem.

3.4 Communication stage

- Give a name to your invention.
- Display posters or sketches, and tell the story of your invention.
- Be prepared to answer questions. The following are examples of problem.
 - ◆ Where did your inspiration come from?
 - ◆ How did you come up with a solution?
 - ◆ Where do you get parts and materials?
 - ◆ Who helped you? What did they help you with?
 - ◆ Who could use your invention? How would they evaluate it ?
 - ◆ How do you want to improve your invention?