

*Review*

# Industry-Academy Cooperation in Taiwan: A case study of Taiwan Fastener Museum

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**This paper describes the collaboration between the Taiwan Fastener Museum and the Department of Education to carry out educational activities and contents of museum readiness. It employs three corporate strategy techniques: SWOTS, which links the current state of the museum industry to continue a cross-study review of industry-academia collaboration that focuses on maintaining strengths and potential while strengthening vulnerabilities and threats; STP, which determines the direction of markets and consumers in the museum industry; 6C review, which continues an emphasis on market research. Story Plaza, DIY World, Fastener Land, Science Skylight, Fastener Theater, and Maze are the six educational zones of the project's educational activity architecture. The past and role of fasteners was implemented through a narrative approach in Story Plaza. The operation of fasteners will be shown to visitors of DIY World via realistic model-making. Fastener Land blends educational playgrounds with games to help kids appreciate the role of fasteners in daily life. Science Skylight's games feature different tests where you can learn how to use fasteners. Fastener Theater is a drama training approach that introduces learners to fastener knowledge. A maze is a form of evaluation that makes use of a person's fastener awareness. This article makes four recommendations for the construction and expansion of the Taiwan Fastener Museum. First, children's literacy skills should be prioritized. Second, the museum's architectural planning will predetermine its educational purpose to promote future educational benefits. Third, the museum should hire instructional professionals. Finally, the government should work with education-related organizations and schools to encourage industry-academia collaboration.**

**Key words:** Museum education, industry-educational academia cooperation, Taiwan Fastener Museum.

## INTRODUCTION

In a recent analysis, the Organization for Economic Co-operation and Development (OECD) underlined that "the varying degrees of economic and technological success achieved by nations over the past decade have been closely linked to the degree of interaction between public and private research and development (Eslam et al., 2020)." In recent years, the industry-educational academia cooperation has become increasingly popular in higher education. Advanced countries in the world attach importance to collaboration between higher education institutions and industry to enhance their industrial competitiveness and extend their research to industrial applications.

In the past, universities were considered ivory towers, where learning and intellectual pursuits were undertaken

in isolation from practical personal needs or regional economic concerns. The aim of this project is to enable universities to use strategic collaborations that combine teaching and testing services from internal and external schools in order to facilitate industry-education partnerships.

In Taiwan, the museum's educational function has evolved and expanded in recent years. The broadest definition of the museum's function includes museum education, contact with museum guests, audience study, display, and collection. In a particular area, the museum serves as a communicator and can interact with cultural and commercial capital. The museum as a cultural institution has enormous educational potential, and much of what is taught and learned in museums is focused on

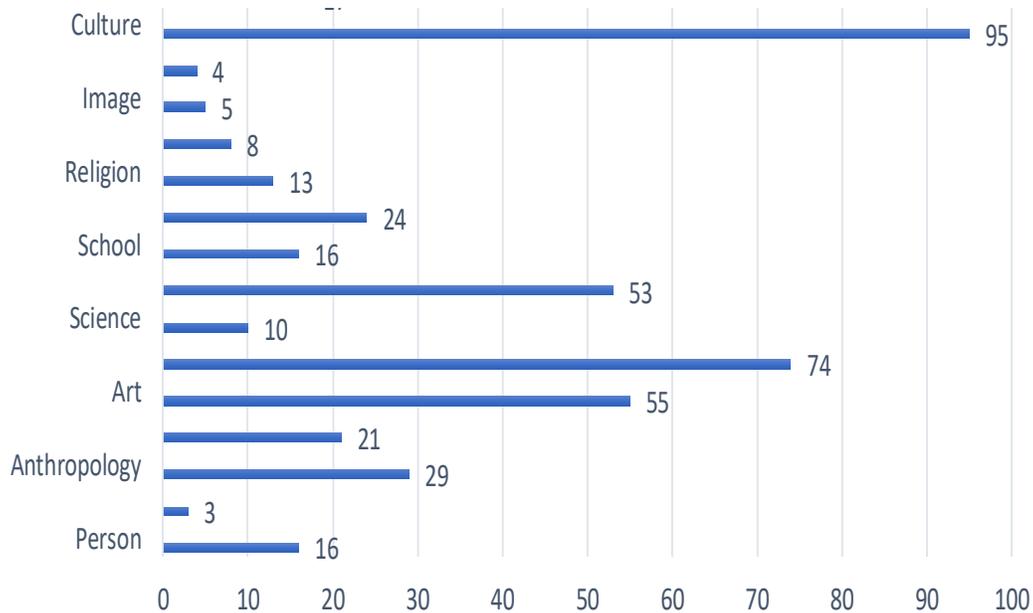


Figure 1. 2021 Museum statistics in Taiwan

the collections. The educational position of museums is critical to both of them. In the museum, we can study and understand a wide range of basic skills and functions (MOE, 2021). Today, most Taiwanese museums are beginning to emphasize their educational role. Since children's perception of museums varies from that of adults, it may be difficult for children to comprehend a museum tour from an adult's perspective. We must respect children and incorporate their experiences and conceptions into museum programs (Hooper-Greenhill, 2013).

The Taiwan Fastener Museum and the Department of Education collaborated on this report to serve as an example of industry-academia collaboration. For comparison purposes, a brief overview of educationally focused museums that have led to the construction and development of the fastener museum is presented.

## DOCUMENTARY

### The development of Museum in Taiwan

In recent years, the museum industry in Taiwan has been thriving due to the improvement of Taiwan's economy and the educational and cultural level of its people. All types of public and private museums must be set up. In addition to public museums, there has been a huge increase in private museums that are operated by individual collectors or enterprises over the past two decades. According to statistics from the Chinese Association of Museums (CAM, 2021), there will be about 451 public and private museums by 2021, and by the end of 2007, the number had

increased to 633. Figure 1 shows the 2021 museum statistics in Taiwan:

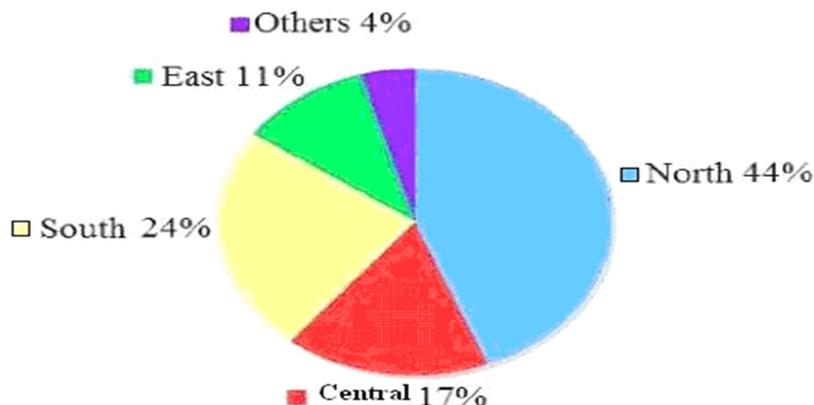
Museums provide a place for the public to learn while having fun, and they are likely to become a new creative cultural industry. From the regional distribution of museums (Figure 2), we can find that most museums are located in northern Taiwan. It is better to distribute museums evenly in cities and counties to achieve the consistency of resources.

In order to adapt museums to a consumerist society, please do not lose sight of the fact that education is the primary goal of the museum, and that the elements of entertainment and recreation should be added while focusing on the public interest.

### Museum education

A museum is a kind of informal education. Museums typically embrace informal education; they often do not provide a set curriculum that moves from lower to higher stages, require no commitment, and do not guarantee mastery of basic skills at the end of a visit. The International Council of Museums (ICOM, 1946-2001) describes a museum as a non-profit, permanent organization in the service of society and its creation, which acquires, conserves, researches, interacts with, and presents material evidence of people and their world for the study, education, and enjoyment of the public. Learning can take place in a variety of settings, including libraries, hospitals, historical societies and museums.

Museums play an important part in assisting viewers to acquire the necessary skills and expertise for performance



**Figure 2.** The distribution of Museum in Taiwan

(Shamsidar et al., 2014). Students develop higher-order critical thinking skills by visiting museums that teach, amuse and excite them. Audiences are encouraged to view sensory-rich museum exhibits in a way that fosters sharp interpretation and critical thought in the creation of their own comparisons and assumptions through museum education (Molineux, 2014).

Learning in the museum and understanding the learning of the audience has become an essential part of the museum's work. Museums have taken on a major educational role in many countries through programs and exhibitions intended to benefit various segments of the population, and they have also become active protectors of culture rather than merely passive collectors of cultural artifacts (George, 1998). Moreover, museum educational programs are becoming increasingly unique and diverse as museum teachers or tour guides collaborate with schools to grow. Hooper-Greenhill (2013) mentioned three aspects of the most popular museum-school collaboration. School Trip, Special Tour, Art-Making School Tour, and Self-Tour are the first student events. Teacher Workshops, Adult Program & Teaching Credits, and Teacher's Night are among the second-tier events for teachers. The third involves delivering consultation, assistance and instructional materials. The increasing importance of education in museums, as well as education's growing role in influencing museum missions, necessitates an analysis and understanding of education in museums.

### **The development of Fasteners industry in Kaohsiung, South Taiwan**

The growth of the fastener industry in Taiwan shows a clustering impact that merges the upstream, midstream and downstream industries and establishes an awfully tight supply and demand chain due to the influence of environmental factors, manpower needs, and technicality.

There are currently 1600 fastener factories in Taiwan,

with more than 500 in Kaohsiung, accounting for around 30% of the total number, but its output volume accounts for 70% of Taiwan's total value of production. Taiwan's fastener industry has produced a significant amount of foreign exchange (Taiwan fastener museum, 2021). Fastener factories in South Taiwan are mainly concentrated in Kaohsiung, which has become the center of Taiwan's fastener industry, as well as the world's largest supply base. As a result, Taiwan has earned the moniker "Kingdom of Fastener Exporting Nation" and Kaohsiung has earned the moniker "Fastener Center." However, Kaohsiung not only has a strong fastener industry, but also interacts with the local culture and community to produce unique characteristics; this is why the fastener museum was built in Kaohsiung (Figure 3).

### **MARKET ANALYSES**

A good understanding of the business context is essential for a profitable destination. Introduction to Business Marketing and Consumer Marketing, as well as specialized courses like New Product Development and Innovation, Brand Management, and Marketing Planning, are among the marketing topics covered. Value-Based Selling and Negotiations are examples of sales subjects. There are detailed industry studies about the Taiwan Fastener Museum's collaboration with the Department of Education (Figure 4). It focuses in particular on the analysis of SWOTS (Strengths, Weaknesses, Opportunities, Threats and Strategies), STP (Segmentation, Targeting and Position), and 6Cs (Concept, Customer, Competitors, Capabilities, Capital and Continuation).

### **SWOTS Analysis**

The main purpose of SWOTS is to combine the current



[http://www.fastener-museum.com.tw/main.php?page=about\\_01](http://www.fastener-museum.com.tw/main.php?page=about_01)

**Figure 3.** Taiwan Fastener Museum



[http://www.fastener-museum.com.tw/main.php?page=about\\_02](http://www.fastener-museum.com.tw/main.php?page=about_02)

**Figure 4.** Peak maturity of varieties as affected by 80 kg Nha<sup>-1</sup> in Kibos.

museum industry situations and industry-educational academy cooperation and to perform a cross-study analysis, with an emphasis on reserving the strengths and opportunities and supplementing weaknesses and threats.

**Strengths**

1. Uses instructional ideas to create projects tailored to children.
2. Creates nonjudgmental worlds in which children can be children and learn for the rest of their lives.
3. Creates engaging meeting spaces for communities to learn and play with one another.
4. Hires museum employees with a technical educational experience and educational opportunities.

**Weaknesses**

1. Some adults find it difficult to maintain their curiosity.
2. Buildings can be affected quickly.
3. It is impossible to fully eliminate the children's safety

concerns.

**Opportunities**

1. The government offers financial assistance.
2. The school will implement a curriculum for grades 1-9.
3. Fasteners are found in virtually every aspect of our daily lives.

**Threats**

1. There are no good traffic connections with other areas of the world.
2. A financial crisis.
3. Taiwan has a diverse range of museums.

**Strategy**

1. *Strengths + Opportunities*
  - (a) Holds the "Theme Day" with various kinds of activities.

- (b) Constructs the new and useful experiences from the children's living activities.
- (c) Sets up the "Learning Museum" with educational theories.

### 2. *Strengths + Threats*

- (a) Cooperates with the local Government to provide transportation such as shuttle buses.
- (b) Develops national and international alliances and partnerships that provide opportunities for local collaboration.
- (c) Sells the ticket packages of museums.

### 3. *Opportunities + Threats*

- (a) The activities are vibrant and immersive.
- (b) Provides learning experiences for all family members.
- (c) Inspects and ensures the protection of equipment on a daily basis.
- (d) Establishes emergency services at the museum.

### 4. *Weakness + Threats*

- (a) Makes museum buildings more comfortable and safe.
- (b) Pay heed to more than just a particular holiday or events that are part of the school program.
- (c) Investigates and establishes instructional architecture for day-to-day practices.
- (d) Enhances the museum's ability to expand in order to address the changing demands of the Six Educational Zones.

## **STP Analysis**

The STP Analysis is designed to establish the orientation of the market and customers in the museum industry.

### **Segmentation**

According to Kotler's Marketing Management, we conducted a survey of the STP. Kaohsiung is home to the Taiwan Fastener Museum. It serves as a major military base, as well as an agricultural, commercial, and heavy-machinery center. The metal industry, especially fastener manufacturing, is the most important industry in Kaohsiung. We are focusing on kindergarten, elementary, and high school students and their families as visitors of a certain age range. The museum will help strengthen the local community. Visitors may remember, preserve or learn about the tradition of fasteners.

### **Targeting**

In this museum, the primary consumers are children and their guardians. In terms of their schooling, the museum of fasteners serves as a learning and relaxation hub for

schoolchildren and parent-child pairs. They can digitally learn a wide range of knowledge, culture and fastener skills.

### **Position**

Unlike other museums, the Taiwan Fastener Museum adopts a distinctive, innovative, specialized, and instructional appearance and perspective to create everything necessary to provide visitors with a pleasant learning experience and substantive learning.

## **6C Analysis**

The aim of the 6C review is to emphasize industrial force and transform abstract concepts into concrete actions.

### **Concept**

Educational theory and learning styles address some of the fundamental issues and concepts in educational theory, as well as the issues surrounding them, which make the fastener museum field so powerful. Not only does it provide customers with the opportunity to view the museum, but also provides a place for parents and children to interact.

### **Customer**

It creates instructional designs for children that are appropriate for both parents and children to partake in together, as well as for schools to hold outdoor educational events. Here, teachers should also participate in a "Curriculum Integrated Day." The people of this region are museum visitors; the museum serves as a spot of leisure for them. The community college in southern Taiwan is an example of a suitable teaching and learning facility.

### **Competitor**

As far as museums are concerned, they are both rivals. Statistical benchmark data were collected from museums in Taiwan in order to map and assess current and new patterns of museum development potential in order to satisfy the changing needs of Taiwan Fastener Museum.

### **Capabilities**

A high-quality museum will not only leave a lasting impression on tourists, but will also provide access to a wide range of information to many more people. The

museum brings together the expertise and talents of government, businesses, research institutions and experts to create a museum that can have the greatest impact on the economy and academia.

### **Capital**

The government provides funding for the museum with the sole aim of constructing public spaces. We would be able to have more and more modern facilities if preparations are made to join the company.

### **Continuation**

It will diversify Taiwan Fastener Museum's goods and facilities, as well as its sources of revenue, to ensure the museum's long-term viability as a valuable resource. Educational events would be an attempt to actively reinvent such that the fasteners museum becomes a distinct and special experience.

## **SIX EDUCATIONAL ZONES**

An educational theory that deals primarily with meaning and knowledge and tells little about teaching, which is the plan for how to carry out the educational activity as described by the theory, especially requires a detailed elaboration of the pedagogical activities appropriate to it (George, 1998). This museum will connect the educational theories to the practical environment. Based on the culture, history, and knowledge of fasteners, these six educational zones adopt specialized educational theories, such as Dewey's "Learning by Doing", Vygotsky's "Zone of Proximal Development", Ausubel's "Meaningful Learning", Bruner's "Principle of Motivation", Piaget's "Cognitive Development", etc., to design the programs and equipment (Duranti, 2017).

This museum would hire instructional personnel with specialized educational backgrounds to oversee educational programs in order to achieve greater teaching and learning impact across the six educational zones. Trained educational personnel should capture the central importance of lessons and services for meaningful learning at the museum.

### **Story Plaza**

When one visits a museum, the introduction to the museum's past or exhibits is either written or shown in a static manner. The Story Plaza project not only uses a story-telling format (a storytelling teaching method) to explain the history of fasteners from the perspective of children, but also interacts with children through absorbing

exercises in order to improve their learning outcomes. The Story Plaza also offers a variety of social opportunities for children by enlightening their ingenuity and imagination through imaginative and vivid characters and plots. Storytelling can stimulate children's listening skills and the development of self-awareness, as well as enhance their language abilities.

### **DIY World**

This field focuses on growing children's interest in learning and increasing their realistic operation opportunities by "Do It Yourself." This is more beneficial for children's build-up of self-skills while they are experiencing the DIY learning process. To help children build the idea of fasteners, DIY integrates graphic architecture with technical preparation. DIY not only provides immediate input and a sense of pride, but also encourages children to participate more actively (Eslam et al., 2020). DIY teaching is more convenient than conventional teaching because it provides access to knowledge that is profoundly embedded in our minds. It also influences future schooling or daily life experiences by forming the learning transfer.

### **Fastener Land**

Fastener Land is a game-based educational sandbox that teaches about the use of fasteners in our daily lives. This field, in addition to encouraging parent-child engagement, can inspire children to think creatively and generate more new ideas. The theme land always brings a pleasant visual experience (John et al., 2000). The Fastener Land has a distinct theme, and everything about it, including its architecture, services and management, is based on that theme. By meticulous planning and design, children will learn in a calm and healthy environment.

### **Science Skylight**

Fasteners can be used anywhere in the living world. Even though fasteners invisible, they play an important role. The Science Skylight project uses a game-like approach to integrate and learn about the features and applications of fasteners, as well as to plan displays. The Science Skylight highlights the first-hand contact that children have with the exhibitions by giving them many opportunities to run them with their own hands. Apart from knowing, we also want people to communicate knowledge that is necessary, useful and meaningful to everyone, no matter where they are.

### **Fastener Theater**

The Fastener Theater uses a drama training approach to

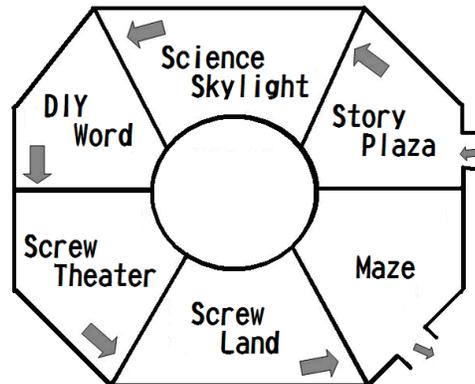


Figure 5. Six Educational Zones.



Taiwan Fastener Museum- activities<sup>↵</sup>  
<http://tomchun.tw/tomchun/2015/11/25/1-292/><sup>↵</sup>

Figure 6. Taiwan Fastener Museum- activities.

bring fastener skills to students. The theater is an artistic drama activity with a wide range of possibilities and versatility. The aim of the Fastener Theater is to enable tourists to experience the sight of a drama, while also learning about fasteners in a free and simple manner. The theater is designed not only for children, but also for young people and their parents. Besides learning about fasteners, children can recreate their own beliefs and memories through the accessible contents and topics of the drama. As a result, they are able to recognize and alter their outdated or negative patterns of behavior, thus allowing themselves to reach their potential, build new

friendships with others, and self- and other-affirmations.

### Maze

The Maze is a method for evaluating fastener information transmitted downward from the first five areas. Piaget discusses the idea of space in cognitive growth. This area uses field operations to direct children's interactions with space so that they can observe and appreciate the real nature of three-dimensions (3D). When you are stuck in a labyrinth, you must answer questions that have already

been heard from other zones in order to find your way back and experience 3D vision of the body. Finally, the entire active space is a learning space that is constantly evolving. Hopefully, children can enjoy learning about fasteners in the Taiwan Fastener Museum across the Six Educational Zones, as shown in Figure 5.

### Conclusion and Recommendation

The Asia-Pacific Economic Cooperation (APEC) aims to encourage creativity and entrepreneurship, as well as to create human capital and expertise, through robust and high-quality education, training and skills growth initiatives. The collaboration between industry and universities is not recent and it differs from the collaboration between an industry and an educational institution. In Taiwan, collaboration between business and educational institutions is a new trend. It focuses on the educational role of industry. The aim of the project is to bring educational concepts and hypotheses to the industry in order to improve it. The primary goal is to promote economic and social growth. It is preferable to use the "Information Economy" to generate economic gains, since business is both an economic and a knowledge object. Finally, museums should place a strong emphasis on children's learning through a variety of programs. The benefit of a museum is that it offers a range of parent-child educational programs. Furthermore, through collaboration between businesses and universities, working conditions

can be expanded and new people in the society can gain a greater understanding of the realistic work of museums (Figure 6).

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