



REPORT ON PACKAGING RESEARCH AND INNOVATION CHALLENGE (JUNE 2019)



Table of Content

EXECUTIVE SUMMARY	2
1.0 INTRODUCTION	3
2.0 The Packaging Research and Innovation Challenge.....	4
2.1 Participants.....	4
2.2 Tour of RCPL’s Manufacturing Facility.....	4
2.3 Orientation by Institute of Packaging of Packaging Ghana.....	5
2.4 Induction by Royal Crown Packaging Ltd.....	5
2.5 Brainstorming and Research	5
2.6 Presentation of Recommendations.....	5
2.7 Evaluation Criteria and Panel	6
2.8 Awards	7
3.0 Feedback on the Challenge	8
.....	10
4.0 Conclusion and Next Steps	10
Annexes:	11

EXECUTIVE SUMMARY

In June 2019, Royal Crown Packaging Limited (RCPL) collaborated with the Institute of Packaging, Ghana (IOPG) to carry out a Packaging Research and Innovation Challenge. The purpose of the challenge was to introduce students in Ghana's universities to the world of packaging and to encourage them to come up with innovative ideas to address challenges in the country's packaging sector.

RCPL, a leading corrugated carton box manufacturing company in Ghana, sponsored the maiden challenge held on its premises from Monday, 24th to Friday, 28th June, 2019. The challenge was facilitated by the IOPG. Twelve students (8 male and 4 female) from the University of Ghana, Kwame Nkrumah University of Science and Technology and the Ashesi University participated in the Challenge.

The one-week challenge involved:

- a tour of RCPL's production facilities
- a presentation by IOPG on the packaging industry and the role of packaging in trade facilitation
- a presentation on RCPL's operations covering Sales, Research and Development, Quality Assurance, Production and Supply Chain
- brainstorming to identify challenges observed during the tour and from the presentations
- research to come up with innovative solutions to the challenges identified
- report writing and presentations on findings and recommendations and
- awards ceremony.

The students were tasked to identify operational bottlenecks within the RCPL and recommend ways of addressing these challenges. They were to ensure that their proposed solutions or recommendations were:

- innovative
- environmentally friendly; would
- reduce cost
- increase market share
- increase productivity and efficiency and
- lead to sustainable profitable growth.

A total of seven (7) recommendations were presented by the three universities (Challenge Reports and Presentations attached). Ashesi University was adjudged the overall winner with the University of Ghana and KNUST taking the second and third positions, respectively. All the three universities received cash awards and internship opportunities with RCPL for periods ranging from one to three months.

The RCPL is considering organizing the challenge annually and extending it to cover students from other universities in Ghana.

1.0 INTRODUCTION

Packaging, defined as the technology of enclosing or protecting products for distribution, storage, sale and consumption creates value, enhances economic growth and facilitates merchandise trade. However, packaging in Ghana is still very dependent on imports. Ghana's packaging sector is also confronted with the lack of the requisite skilled labour for the design and development of packaging, testing, operation and maintenance of existing machinery.

Medium and large manufacturing companies in Ghana depend mainly on local converters for their packaging materials. For high quality packaging, however, these companies resort to imported packaging materials to ensure that their products are attractive and meet international standards.

The non-traditional exports sector which makes significant contributions (about 38%) to the country's foreign exchange earnings is also confronted with the problem of poor packaging resulting in high product damages and income losses. This has resulted in an increasing trend of contract packing of consumer goods overseas particularly from China.

There is limited investment in new technologies and innovation in Ghana's packaging sector. In the paper conversion sector for instance, there is a relatively small market with about seven (7) paper box converters, including Royal Crown Packaging Limited (RCPL). This sector is also confronted with challenges. More than 80 - 90% of raw material required for the production of corrugated boxes (paper, starch, inks, strapping materials) are imported. Conversion machines, equipment and accessories (printing plates) are also imported.

Shrink wrapping with plastic film has overtaken corrugated boxes as the preferred shipper for beverages. This has adversely affected the paper conversion sector due to a reduction in demand for corrugated boxes.

These challenges call for research and innovation by the existing paper converters to access and maintain a fair share of the market for sustainability.

2.0 The Packaging Research and Innovation Challenge

From 24th- 28th June 2019, the RCPL and the IOPG carried out the first ever Packaging Research and Innovation Challenge for students of the University of Ghana, Kwame Nkrumah University of Science and Technology and the Ashesi University.

The Challenge was aimed at introducing students in Ghana's universities to the world of packaging and to encourage them to come up with innovative ideas to address challenges in the packaging sector. The maiden challenge focused on the RCPL, a leading corrugated carton box manufacturing company in Ghana. The students were tasked to identify operational bottlenecks within the RCPL and recommend ways of addressing these challenges.



Members of IOPG with the students who participated in the Challenge.

The Challenge was coordinated by Sally Osei-Boateng, Group HR and Corporate Communications Head of RCPL.

2.1 Participants

A total of 12 students participated in the week-long Challenge. There were four (4) students each from the University of Ghana, Kwame Nkrumah University of Science and Technology (KNUST) and Ashesi University.

2.2 Tour of RCPL's Manufacturing Facility

The Challenge started with a tour of the RCPL's manufacturing facility to enable the students to acquaint themselves with the operations of the company and the process of producing corrugated boxes. The students were taken through the various sections of the factory where they were briefed on the operations of these sections and their contribution towards the achievement of RCPL's corporate goals. The Heads of Section answered questions from the students and shared their strengths and challenges with them.



A tour of RCPL's production facility.

2.3 Orientation by Institute of Packaging of Packaging Ghana

Mr. Kofi Manso Essuman, immediate past President of the Institute of Packaging, Ghana (IOPG) set the tone for the Challenge with a presentation on the Packaging Sector in Ghana and Challenges in the Paper Conversion Sector. The objective was to broaden the knowledge of the students about the paper and paperboard industry. He explained the purpose and modalities of the challenge to the students and answered their questions.

2.4 Induction by Royal Crown Packaging Ltd.

The Managing Director of RCPL, Mrs Emelia Ohene Kena and the heads of various departments including Sales, Research and Development, Quality Assurance, Production and Supply Chain, made presentations to the students highlighting RCPL's operations and supply chain processes.

2.5 Brainstorming and Research

On the second day of the challenge, the students brainstormed in their respective teams to identify key challenges within the operational areas of RCPL and recommended solutions. Each team identified two to three key challenges to be addressed. The teams spent the third and fourth days conducting research for solutions to the identified challenges. At the close of the fourth day, the students submitted their reports to a panel of evaluators for review and scoring.

2.6 Presentation of Recommendations

On the fifth and final day of the challenge, the students made Power Point presentations of their recommendations to a panel of evaluators and staff of RCPL. The table below shows the challenges identified by the students from the three universities and the recommended solutions.

Institution	Challenges Identified	Solutions Identified
University of Ghana	<ol style="list-style-type: none"> 1. The issue of waste water disposal from water-based paints 2. Increasing the market share of RCPL both locally and internationally through social appeal 3. The extortionate price of the corn starch used 	<ol style="list-style-type: none"> 1. Design of a waste water treatment process 2. Increasing the market share of the company by making embossed braille printing on corrugated boxes for visually impaired clients 3. Replacement of imported corn starch with locally available cassava starch for binding
Ashesi University	<ol style="list-style-type: none"> 1. Delays in transactions between RCPL and its customers 2. Cost and Energy usage of machinery 	<ol style="list-style-type: none"> 1. Design of the BOX-IT app - a mobile application to digitalize the interaction between existing or potential clients and the company 2. Automated Time Management System 3. Material Selection Software 4. Material Simulation Software
KNUST	<ol style="list-style-type: none"> 1. Unique corrugated cartons 	<ol style="list-style-type: none"> 1 Add a natural fragrance to the glue combination to produce a scented box

	2. Weak strength of Corrugated boxes due to water absorption	2 Application of wax on corrugated cartons to make them waterproof
--	--	--

2.7 Evaluation Criteria and Panel

The students' presentations and recommendations were evaluated by a five-member panel in accordance with the following criteria:

- Innovativeness
- Environmental impact
- Cost reduction
- Contribution to increase in market share
- Contribution to higher productivity and efficiency
- Ability to sustain profitable growth.

The panel members were:

- | | | |
|--------------------------------|---|--|
| 1. Mrs. Emelia Ohene-Kena | - | Managing Director, RCPL |
| 2. Mrs. Akosua T. Febri-Yeboah | - | Asst. Quality Manager, RCPL |
| 3. Mr. Richard O'Brien Sowokey | - | Senior Quality Supervisor, RCPL |
| 4. Mrs. Caroline Tsikata | - | 2 nd Vice President (Business Development, IOPG |
| 5. Mr. Prince Agyenim-Boateng | - | Executive Member, R&D and Consultancy, IOPG |



The panel members including the MD of RCPL (seated left) evaluate the students' submissions.

2.8 Awards

1st Prize - Ashesi University won the first prize with two submissions. The first was a digitized application named “BOX-IT.” This application has been designed to reduce transaction time between RCPL and its customers. Customers who log on to the application will be able to select the type of boxes and materials required, have a simulation of the box design and the estimated cost of producing it. The Ashesi team also designed an automated time management system to track and help to reduce the time and energy spent in loading and off-loading items transported in and out of RCPL. They received a cash prize of GHS1,500, three months attachment with RCPL for each student, certificates of participation for the students and their university and lunch with the Managing Director of RCPL.

2nd Prize - The University of Ghana won the second prize with the development of a waste water treatment process, and recommendations for replacing the use of the more expensive imported corn starch with a relatively less expensive locally produced cassava starch as adhesives for the corrugated boxes. They received a cash prize of GHS1,000, two months attachment with RCPL for each student, certificates of participation for the students and their university.

3rd Prize - The third prize was won by the Kwame Nkrumah University of Science and Technology with the recommendation to RCPL to produce waxed corrugated boxes to reduce moisture absorption. The team from KNUST also recommended the production of scented boxes through the addition of natural fragrances to differentiate RCPL’s boxes from that of competitors. They received a cash prize of GHS500, one month attachment with RCPL for each student, certificates of participation for the students and their university.

The contestants also received RCPL souvenirs and assorted drinks from RCPL’s sister company, Kasapreko Company Limited.

The Managing Director of RCPL, Mrs. Emelia Ohene-Kena, who presented the awards lauded the students for their innovative ideas. She assured them that their recommendations would be implemented.



The students display their dummy cheque for the awards. Also in the photo is the MD and staff of RCPL and members of IOPG.

3.0 Feedback on the Challenge

A post evaluation of the challenge with the students revealed the following key issues:

1. The challenge was well organised and insightful. Students had a practical feel of the theory learnt at the university. It allowed the students to think openly and to innovate around the problems identified in the packaging industry.
2. The duration of the competition was not enough. This should be extended beyond one week to give contestants enough time to review the challenges and propose solutions.
3. The competition should be opened to more universities and organised once or twice in a year.
4. The noise level in the factory should be reduced during factory visits/tours to allow persons being taken round to hear explanations being given.
5. Staff of RCPL and the resource persons from IOPG were very open and helpful.

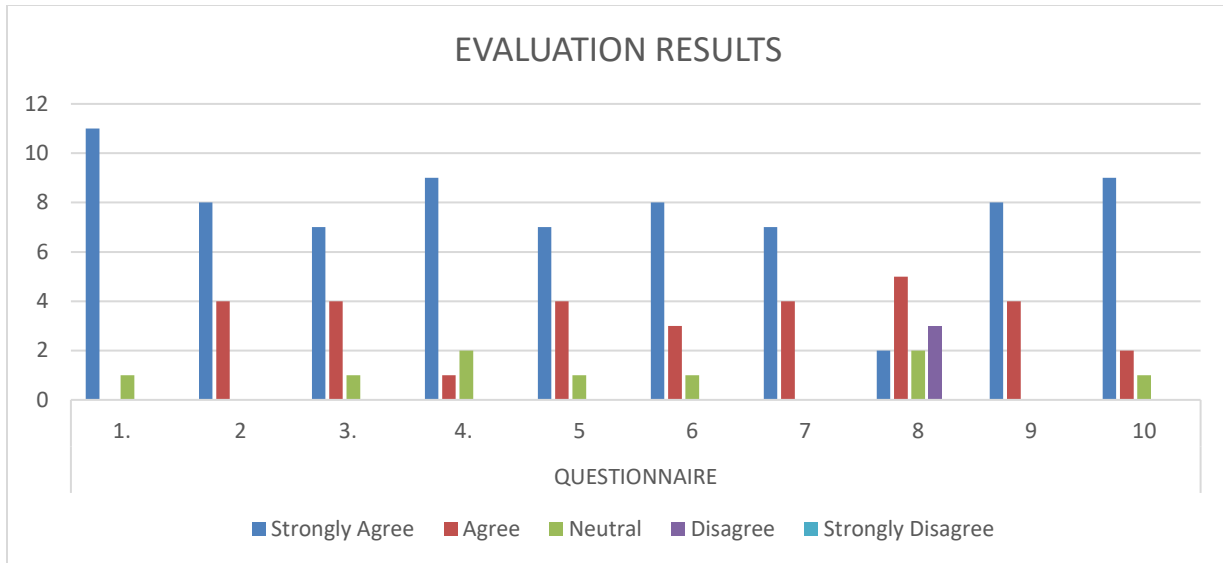
Key lessons learnt by the students from the challenge include:

1. The process of manufacturing corrugated boxes.
2. Challenges can be resolved faster through team work and focus. One does not need to have all the technical knowledge on a subject matter to be able to solve a problem.
3. Proposed solutions should not create new problems.

The following suggestions were made for the organization of future Challenges:

1. Consider providing accommodation for contestants to allow full concentration on the challenge and in-depth research. Travel to and from the factory was time consuming and tiring.
2. Extend the duration of the competition to allow competitors enough time to conduct research.
3. RCPL should develop a corporate profile with information on all its departments and hand this out to contestants prior to the factory visit to enable them to better appreciate the processes.

The evaluation results and questionnaire are presented below:



QUESTIONNAIRE
1. The objectives of the competition were clear to me.
2. The level of participation and interaction was high.
3. The knowledge and exposure were relevant to me.
4. The competition was well organized and easy to follow.
5. The factory tour, presentations and materials provided were helpful
6. The experience gained from this competition will be useful in my career.
7. Persons who made presentations were knowledgeable about their topics.
8. The period allotted for the competition was sufficient.
9. My expectations were met.
10. The meeting room, organization and logistical arrangements were adequate



The students from the three universities who participated in the Challenge.

4.0 Conclusion and Next Steps

On the whole, the Packaging Innovation and Research Challenge was successful. The partnership between the RCPL and IOPG has helped to rekindle interest in packaging, build skills and raise the next generation of experts for the packaging industry.

Additionally, the challenge has demonstrated how industry can benefit from academia, and how resourceful students from Ghanaian universities are. It also revealed the existence of a huge potential in Ghanaian youth that can be tapped to solve local problems.

For the next steps, the RCPL will assess further the feasibility of the recommendations made by the students for implementation.

The RCPL will also host the 12 students for the practical attachment over the next three months. During this period, the company will work with the students to implement their recommendations.

The RCPL will also work with the IOPG to roll out the next challenge.

Annexes:

1. List of Students and participating universities
2. Presentation by Kofi Essuman, IOPG
3. Challenge Reports and Presentations
4. Evaluation Forms