Managerial skills development in R&D based NTBFs

Assisting managers to manage

Chris Blaydon, William Keogh and Gary Evans
Robert Gordon University, Aberdeen Business School, Aberdeen, Scotland

Keywords Workplace learning, Management development, Technology led strategy

Abstract This paper seeks to illustrate and explore strategic issues from the perspective of the research team in designing, delivering and monitoring an education programme for new technology based firms (NTBFs) which has been run successfully for the last two years by the Robert Gordon University. Findings from recent research, involving innovative NTBFs, have shown that these organisations may be struggling in a number of areas such as maintaining communication with their main customers and staff recruitment which relates to serious skill shortages. The model proposed in this paper of an effective management skills programme for NTBFs is one way forward in assisting owner/managers in developing and utilising their scarce resources effectively.

Introduction

Rothwell, (1994) indicates that the problems faced by innovative new technology based firms (NTBFS) go much further than the technological challenges that they strive to overcome. As the companies grow and develop, managerial skill issues come to the fore. The founder, or owner manager, may well come from a scientific, engineering or technological background and they are faced with another set of issues to deal with – issues for which they may well be unprepared. The new skill base that they require includes: understanding marketing principles; recruiting, training and keeping their staff. Thus human resources (HR) come to the fore, particularly as they grow; understanding finance, negotiating margins and raising awareness as they become targets for acquisition (Oakey, 1995); and, given the nature of the industry in the Aberdeen area (Green, 1994; Keogh and Bower, 1995; Bower and Keogh, 1997; Bower et al., 1998) working on, or within, alliances for competitive advantage.

The technology-related organisations, featured in this paper, face management growth issues when operating in changing market places. These organisations, many founded by entrepreneurs, often have a high level of knowledge base which enables them to get the product or service out of the door and, at the same time, operate in varying degrees of unpredictable environments where technology and customer needs change. Both the risk and
opportunity to companies operating in their industrial sectors are high and the challenge of managing and sustaining the growth of organisations in this type of environment is complex. Therefore the managers require to be equipped with appropriate strategic management and thinking skills to improve productivity and profit margins. The strategic skills need to be aligned to the issues which the managers face, so that they can learn how to plan to develop sustainable structures and processes that create organisational climates which aid survival and allow them to respond to the needs of a dynamic environment. Indeed, in developing strategies for their organisations the competencies and experiences of the senior managers will reflect on the way they plan for growth (Jones-Evans, 1996).

Research and development has a key strategic role to play in the companies discussed. The NTBFs have to be innovative - not just to survive but to grow (Keogh et al., 1998a). Profit margins in the supply chain (particularly in the oil and gas industry) have been squeezed and this also has an impact on how managers operate (Keogh et al., 1998b).

This paper seeks to illustrate and explore these strategic issues from the perspective and experiences of the research team in designing, delivering and monitoring an education programme for NTBFs, known as The Strategic Management Development Programme (SMDP). This programme has been run successfully by the Robert Gordon University over the last two years. The SMDP, as a model, demonstrates how to address key issues for senior managers, with tools and techniques which have been identified as important for strategic planning in research and development oriented organisations. The elements of the model are described and the effectiveness of the materials of the SMDP and their direct application to the workplace are discussed.

Background to the strategic management development programme
The development of the SMDP started in 1994 when it was funded and supported by Grampian Enterprise. It transferred to the Robert Gordon University early in 1997. The early phases of development focused on incrementally piloting the different modules on new technology based SMEs located on the Aberdeen Science and Technology Park. This involved small groups of directors and owner managers from selected businesses working closely with a team of trainers from Grampian Enterprise Limited. Those attending the early programme not only learned, but also contributed towards the development of the modules. This approach provided first hand experience and feedback of the value of the material to the directors and their businesses – and to the developers and deliverers of the programme. Learning by the trainers has continued in this way and efforts are made to continually develop the programme based on customer feedback. The programme has recently been accredited through the CAT scheme. This will provide interested managers with CPD points which will contribute towards other qualifications.

Managers who are responsible for the strategic growth of technology related business are, in general, technically oriented and well qualified in their
particular discipline but may have very little “formal” management education or personal development. The managers involved in this programme to date, are responsible for the growth of their organisation and had reached a stage where they were beginning to appreciate the need to plan for growth in a more structured way, i.e. if they are to meet the demands of the environment and sustain the flexibility in the organisation. In addition to this, SMEs are often dealing with a customer base where many organisations are much larger than themselves with differing strategies. The strategic elements which the NTBFs have to consider are illustrated in Figure 1.

Discussions in the early stages of the programme highlighted the triggers for the managers, which encouraged them to look for more effective ways of identifying issues and planning for growth. Each director (or senior manager) identified a path to creating sustainable growth but could not see a picture of what it should look like, i.e. in terms of market development and/or product develop together with the structure and people within the organisation who provide the key resource within any company. From these discussions it was also apparent that most directors and senior managers could not use the same set of theories to grow their company, but needed to develop their own theories and route for growth, that was unique to them but within a framework (see Table I).

The first step in developing the programme was to assess a variety of tools that managers could use to develop “a picture” of the current situation facing the organisation. In order to develop the “future picture” and policies which an organisation needs to focus on, for sustainable growth, requires the key elements of strategy.
individual(s) to develop their own rules for growing the business. This process of analysis was carried out through interview and group discussion. Various options were piloted and the development of the programme was continued through the introduction of a think tank where business managers, the Dean of Aberdeen Business School, representatives from other Universities, business advisers and the LECs were involved at different stages. Every element of the programme was examined thoroughly and discussed using this method and a number of lesson were learned from this. These lessons are illustrated in Table II.

Another vital area in order to promote the success of the programme was to have the “human resource” focus pervade core modules and business subject areas. The aim was to build human resource thinking and theories into the tools and learning process to create strategies, which were realistic and could be implemented. This was seen as the common thread throughout all modules.

Table I.
Key issues identified by the senior managers

- Technology “people” did not have the interpersonal skills to understand how to develop others and get them to do what they wanted
- As the organisation grew managers lost sight of what they were and the market they were in
- Shareholders were unclear about the growth strategies for the organisation – “do everything instead of concentrating on what the organisation is good at” – niche player etc.
- Managers knew they needed structure of some form but not the traditional structures which stifle growth and innovation
- A lack of understanding of business planning leading to the identification of new areas of business etc.
- A lack of understanding about their businesses place in the supply chain
- Staff recruitment difficulties to get the person who fitted with the type of organisation they wanted and a failure to communicate this – when advertising and interviewing
- The roles in top management are unclear, as they evolve there is no planning in line with a strategy or vision or understanding of operational and strategic roles and how they apply to their business
- Clients see this confusion emerging as they have higher demands on these organisations
- How to get people to contribute to the development of products and services and communicate effectively
- Knowing that team working is important in the bigger company but unable to replicate it internally in their own business
- Lack of understanding of what the Local Enterprise Company (LEC) can do in terms of graduates, non executives etc.
- How to use corporate knowledge and retain it and bring the right mix of people in.
- Lack of understanding of what the Local Enterprise Company (LEC) can do in terms of graduates, non executives etc.
- No clear marketing plans that are followed through
- No links to HR in conjunction with shortening product development processes and how people behaviours integrates into this process
- Performance of project is rarely measured
Participating organisations
The target audiences for this programme were technology-oriented managers who were responsible for the growth of SMEs. These are most likely to be the owner manager, director or senior manager whose role is to assist with the strategic planning of the business. Small groups of managers were invited to attend each of the modules to share their learning in a structured way. The managers tend to be entrepreneurial in nature and prepared to look objectively at their business and share their thinking.

The businesses, based in Scotland, come from the following sectors:

- biotechnology;
- software;
- electronics;
- engineering.

The target companies participating in the SMDP over the last five years have typically been SMEs with a technology focus in the above categories. The programme was delivered in Scotland, where cluster groups, science parks, incubator units and various regional support policies for the stimulation and
regeneration of key business are well established. The companies participating were not start-up companies but those that have grown past this phase. It has been found that these companies typically need more in depth practical intervention linked to business development. Many of the companies involved are in sectors which tend to offer high growth potential such as electronics and biotechnology (including those working in pharmaceutical research) and they exhibit characteristics of high growth SMEs identified by a number of authors including Smallbone et al. (1995).

Recent research (Keogh et al., 1998a) involving a number of companies which participated on the programme focused on key issues of strategic importance for these SMEs while a parallel stream of research investigated stakeholder issues and Science Parks (Evans et al., 1998). The sample was classified in five groups based on the principle activity which they undertook, as follows:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number of companies selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>7</td>
</tr>
<tr>
<td>Software</td>
<td>4</td>
</tr>
<tr>
<td>Instrumentation/electronics</td>
<td>4</td>
</tr>
<tr>
<td>Analytical services</td>
<td>4</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>1</td>
</tr>
</tbody>
</table>

The following figures may well be representative of the types of organisations that take part in the SMDP. Figure 2 illustrates that education levels vary between sectors and it can be see that the biotechnology (last on the right) company had 100 per cent of their staff at degree level or higher.

Research and development plays a vital role which enables the companies to maintain their market niches. One difficulty with investigating R&D spend is that the companies include different expenditures in their calculations. They may include the number of staff, design input or consumables. Therefore, as well as having different requirements for products/services, it is very difficult to draw meaningful comparisons of expenditure by the organisations. What did emerge was that estimates were given on R&D spend as it currently stood and what was planned for the future. Figure 3 illustrates that the software companies tend to spend more of their turnover than the other sectors except the biotechnology company (not included) which, as an R&D unit, spends all income on R&D. Two companies offered figures for their present expenditure but could not forecast, and one organisation did not answer the question.

**The management development programme model**

The Robert Gordon University’s Centre for Entrepreneurship and SMEs has continued to refine a strategic management development programme, with the aim of developing individuals who are responsible for and sustaining the growth of their organisation and to nurture creativity and innovation at all
levels. The SMDP model described below provides the framework for developing the strategic management skills of senior managers. The model forms an integrated approach to developing the knowledge and understanding of the different elements of strategic business planning coupled with the learning style for developing strategic thinking and the transfer of learning into the workplace.
The programme concentrates on three stages. In the first stage, the managers assess both the current and future needs of their organisation in terms of the organisation’s structure, communication/information sharing, behaviours, culture and values, goals and vision. This is aligned to the skills of those responsible for embedding the culture and encouraging contribution and creativity, so that they can be transferred into the workplace whilst sustaining change requirements. The second stage integrates the marketing and product development processes within the organisation. The final stage of the programme identifies the financial performance of the company and again links the development needs to the organisation.

Modules
The three stages described above form a series of four modules, each of which provide a set of tools and techniques to form an integrated approach towards developing business strategies. The series of modules, where each module lasts for three days (each day being scheduled two weeks apart) include:

- strategic and organisational planning (see Appendix 1);
- marketing planning (see Appendix 2);
- product development (see Appendix 3);
- financial planning (see Appendix 4).

A folder of the tools and techniques – which are re-usable within each manager’s organisation, support each module. In addition to this, there is supporting literature to accompany the tools where appropriate. The recording methodology, which results in a strategic plan for the subject area, also forms part of the folder of materials. In using analytical tools that cover many subject areas within each module, the manager uses his/her own experiences to fill in the gaps in order to create a strategic picture of their own business situation. A number of objectives have been developed which combine the learning process with practical application (see Table III).

Learning methodology
The learning methodology adopted for these modules is a process which guides the manager through their own analysis to develop their thinking skills. Experience shows that this approach has been well received and provides maximum benefit to the participant.

Each workshop has a direct output that is applied within the organisation the next day by the participant. Although each module can deliver a desired result, the modules together form an integrated approach to create structured plans, which will sustain the changes and strategies.

Developing the thinking skills approach
The interactive methodology used is fairly simple in that the tools are meant to direct participants’ thinking to build a picture and framework for their
organisation. There is debate and discussion to allow for the reinforcement of ideas. The tool method of applying concepts at different points, in building up a picture in the minds of others, is a very good way of improving the thinking skill. This method is directly compatible with creative thinking techniques. The style of delivery assists the manager to plan the way forward in a logical manner and to interpret the analysis in a way that removes barriers to their thinking. The development of creative thinking requires the formation of a specific cultural environment i.e. non-threatening and supportive. At the end of each module, the set of outcomes is recorded in such a way that the manager can readily understand and share them in a meaningful language to others involved in their organisations.

Three step methodology. Step one forms an analysis of the current situation of the business, aimed at building a picture in the minds of the manager of what is currently happening in their business and to change their thinking in order to see the business in a different way. The results of the analysis are shared with the group so that participants also see their business from other viewpoints. The outcome is a logical recorded plan showing the current position of the business in relation to the business environment.

Step two forms the future alignment process, which focuses on the future of the business strategically plans the growth of the organisation. This step is highly participative and based on the reflection of the learning acquired during the analysis stage. The outcome is a clear record of the future strategic needs of the organisation to achieve the organisational goals and targets in line with the vision.

Step three forms the strategic plan for the module and details changes that are required, together with how to implement them. Each plan is unique to each organisation and owned by the manager(s) involved in the learning process.

- To provide the tools and techniques to analyse both the current and future needs of the participant's business to create a truly innovative and flexible organisation capable of sustained growth
- To provide the knowledge and understanding associated with developing innovative organisations, in a practical way, so that the participant leaves the workshop with the skills to implement the changes required
- To provide the environment for networking and sharing of learning between the participants and to develop an understanding of the development of a culture to encourage innovation
- To allow participants to understand that different parts of organisation require different styles of management to develop the climate required
- To allow participants to appreciate that the change will be unique to their organisation based on their environmental needs, in terms of market change, product development needs and internal change
- To understand how to begin the process of introducing change given the current situation of the organisation and how this fits with current practices and cultures

Table III.
Objectives of the modules
The effectiveness of the tools and techniques
A questionnaire was developed to find out if the participating managers considered if the tools and techniques could be readily applied to the workplace or if they solely developed their knowledge and understanding of the subject area - or neither of these. The questionnaire was sent out to a sample of participants covering all targeted sectors. The sample frame was based on 20 participants taken at random. This sample provided further feedback on the learning process for each module.

The managers targeted in the survey, who had no direct strategic role in the company, found it too difficult to relate the theory to his or her own situation within a business environment and demonstrated this through feedback.

The impact of each module on learning
The strategic and organisational module and marketing modules were developed first to incorporate the human elements from the traditional thinking and theories in these subject areas. However, the product development and financial modules used case study and theory approaches. In the early stages of delivering these two modules, traditional learning approaches were used. They have been developed further over the last year to bring them up to the same level as the strategic and marketing modules.

Out of the four modules:
• 91 per cent of people were able to apply the strategic module to their work situation;
• 75 per cent of people were able to apply the marketing module to their situation;
• 58 per cent from the product development module applied the learning to their work situation.

In all cases participants were able to improve their understanding, apart from the financial module whereby 16 per cent found that it did not improve their understanding.

The finance and product development modules were case study based with limited human resource integration into the module in the early stages of developing the modules.

The main reason for such a high level of relevance to the work situation for the strategic, marketing and product development modules is the linked interactive tools and techniques to deliver the modules.

The research was aimed at evaluating the learning of specific tools used in the strategic module including the following areas:

Organisation analysis
The first questionnaire which aids participants to focus on their organisation was developed from a number of sources including research undertaken by Mintzberg on organisations (1979; 1989). The questionnaire allowed participants to categorise their organisation in terms of the types listed in Mintzberg's work.
83 per cent of participants were able to apply this to their work situation. This had major impact on participants since it is a critical area for sustained growth.

Cultural analysis
The writings of Handy (1991; 1993) provided focus to participants regarding the creation of cultural change and its alignment with the organisation structure. A total of 75 per cent of participants could apply these concepts to their work situation with the other 25 per cent improving their understanding only.

Team behaviour
Organisations contain many types of interaction within functional areas and people. The analytical tools created by Belbin (1981; 1993) allow participants to evaluate their own behaviour in relation to how they interact in a group or team situation. Of the participants, 75 could apply this to the work situation. The framework created for this analysis helps participants understand behaviour and how to build effective teams to improve many aspects such as creativity, innovation and problem solving at board level. Encouraging team aspects, such as producing ideas, contributing to decisions and implementing plans are important and finding a balance for team members which allows them to form better working relationships whilst achieving their goals makes them more effective (Cartwright and Cooper, 1997). The link between the organisation and culture, for the participants, focuses on sharing and identifying barriers to growth.

Motivation
Several questionnaires that relate to the research carried out by McClelland (1988) on motivation have provided new insights into incentive mechanism in different types of organisation with different grades of staff. Of the participants 67 per cent could apply this to the work place. However, this work has evolved with groups of people participating to the point that the facilitation framework leads to directors and senior managers seeing that non-tangible rewards and methods of recognition can lead to higher productivity and change attitudes within an organisation.

Management styles
A questionnaire was developed to identify “management styles”. This has led to a new approach to identifying styles that relate to different activities at director level, project levels and management levels in a company. Again, it was found that 75 per cent of participants could apply this to the work situation. This approach has had a major impact on the way project managers and directors develop the interpersonal skills of key people to motivate and inspire the people that work for them. It also helps create the climate suitable for the type of organisation and culture the company needs to address the issue of future sustainable growth.
Strategies and problems
The study by Keogh et al. (1998a) found that a large proportion of the companies involved recognised the need to plan strategically. Some senior managers were planning their strategy implicitly rather than explicitly, and many of them appeared to operate with emergent strategies. However, it was apparent that the senior managers considered a number of key strategic issues which are interrelated, and which require internal policies to deal with them.

A number of important strategic elements were identified (see Figure 1) and one key area which had to be considered for strategic growth was the internationalisation of the company and most organisations recognised this. Most were investigating new industries to market their products and services and some had already established offices in other countries. Collaboration with main customers can provide opportunities (Segal Quince Wicksteed, 1997). However, evidence collected showed that most of the NTBFs tended to take the risks in developing new products and services and that they were financing these activities from reinvested earnings (see Oakey, 1991). Human resource issues and their importance were stressed in a number of ways: although education levels were generally high, respondents all reported skills shortages. Points were made that it was not enough just to employ graduates to meet strategic targets and objectives as it was the skills mix of the individuals which was important (Grundy, 1997; Jennings and Beaver, 1997). Concerns were raised about recruiting, training, then losing staff. It was indicated that policies are in place in some companies to offer training and enhanced conditions in order to keep valued staff (see Scott et al., 1996).

In determining why the companies had been successful to date, the “markets” and “marketing” featured most prominently in the answers, with 50 per cent of respondents identifying areas such as niche opportunities. The next highest area was the vision/drive/ambition of the managing director. It was assumed that the organisations all wanted to grow. Barriers to growth were very varied and a number of respondents identified several factors. The most important of these appear to relate to “people” with 70 per cent indicating this. “Cash/finance” were identified by some as being major barriers.

Conclusions
Key elements of the SMDP have been found to be preparation of the participating managers and the follow through activities. These elements not only ensure that the right category of manager attends, but it also identifies if they are open to this type of approach to learning and how to apply it to their company’s state of growth. The issue of planning for growth is important and has been discussed by a number of authors including Smallbone et al. (1995).

In the development of the modules for the Science Park companies in Aberdeen a follow through mechanism was provided to help individuals focus on key issues and core actions for the longer term. This was seen as a key differentiator to personal development type programmes and business advisor work provided by the Local Enterprise Company.
Experience of organising and delivering the SMDP emphasises that the time spent on the main phases is strongly associated with the success of the programme. The key factors at the preparation stage include: providing a meaningful explanation of the programme directly to the interested manager; involving them early in the learning process to be adopted through the use of psychometrics; and communicating with them regularly up to the start of the programme. The key factors at the follow-through stage involve the implementation of the strategies and how to operationalise their plans.

Two areas were examined that related to how the modules were facilitated and the skills of the facilitator with groups of people. The style of facilitator and the way the interpersonal skills are used helped 60 per cent of participants apply the tools to the business. The style also helps the discussion and sharing as well as the recording of decisions and developing understanding further where issues were not being resolved within the group process. The knowledge base of the facilitators is a vital aspect of gaining respect of participants. Generally speaking, the participants had started their business and expect the facilitator to relate to them in terms of personal experience and knowledge of running a business. Again this is a knowledge base which is totally linked to developing participants' understanding as well as helping them focus their strategic thinking and apply it to the business situation. One way forward for the future application of the programme would be to focus on the management of knowledge and learning within, as well as within the wider environment of, the participating organisations with a view to assisting them to develop as learning organisations (see Gibb, 1997).

Findings from recent research, by the research team (Keogh et al., 1998a; 1998b), have shown that these types of organisations may be struggling in a number of key areas such as maintaining communication with their main customers and the recruitment of staff with relevant skills. Skills shortages is an issue which recurs time and time again, particularly for SMEs, and affects many organisations (British Chambers of Commerce, 1998). The model proposed in this paper of how to generate an effective management development programme for NTBFs is one way forward in assisting owner/managers in developing and utilising their scarce resources effectively. The programme also assists senior managers to recognise skills deficiencies and aids identification of possible deficiencies in their in-house technical capabilities. Not addressing these aspects can be viewed as shortcomings in relation to the needs of SMEs (Scott et al., 1996) and the programme designers set out to embed the lessons learned from the programme in the participating SMEs.

It is evident that the managers attending the programme operate in changing and unpredictable environments; have a high level of knowledge base; and deal with a level of complexity associated with innovative and flexible organisations. They may well be technical specialists who manage organisations and they need assistance to not only think strategically, but to be able to plan organisational, sustainable growth. These companies tend to be
founded by professionals such as engineers and scientists. Therefore, management training in business is essential to aid them in dealing with the business environment – similar to the key areas identified by Gray (1997). Although the managers (or owner managers) who participated on the programme grew in confidence, it is not clear at this stage that the tangible company benefits derived from those attending the programme have been established and this provides an opportunity for further research (see Storey and Westhead, 1996).

In all cases the SMDP changed the manager’s thinking about the organisation, leading to new ways of growing the business, new ways to get people involved in the business and new ways to keep the business competitive for the future.

References
Appendix 1. Contents of the strategic and organisational development module

The aims of this module are to develop the core strategic skills of managers required to achieve and sustain the growth of the organisation. At the same time, a major outcome is to identify the management development needs of the manager to sustain growth. The programme provides a detailed strategic analysis of the organisation, together with a practical way to plan and implement any changes that are required to align the organisation with the unpredictable industries into which it delivers products and services.

This module comprises many self-assessment related tools that allow the individual to work out his/her situation by answering questions relating to structure, communications, culture, people behaviour and motivation. These tools are arranged in a way that gradually creates a picture of what the organisation looks like. The questionnaire demonstrated that this was successful in all cases.

The areas covered include:

- Environmental analysis – understanding the knowledge base linked to the changing markets.
- Organisational analysis – to understand the different structures that exist and how they need to be managed to improve productivity (including communication methods).
- Cultural analysis – to learn the types of cultures that suit the organisation and how to identify and encourage appropriate behaviours to embed the required culture and values.
- Managerial and team learning – to understand the business skill to manage the organisation and the styles to develop the behaviours and motivations of the people.
- Motivation – to learn how to reward, recognise and appraise people aligned to the organisational goals (and the achievement of IIP if appropriate).
Outcomes

• Analysis of the strategic position of the organisation in relation to the unpredictable
  nature of the markets and the knowledge base required to deliver the products or
  services.
• Preparation of a strategic plan capable of delivering growth.
• Implementation plan for the strategic plan by involving the people within the
  organisation.
• Identification of the additional management skills to improve the organisation's
  performance.

Appendix 2. Contents of the marketing planning module
The aim of this module is to develop the strategic marketing skills of managers required to
penetrate existing markets or develop new markets. At the same time, a major outcome is to
develop a complete strategic marketing plan for a new product or service. The module provides a
framework for market analysis that links to cashflow, a clear strategy and detailed tactics to win
the business. In addition to the tactics, many needs are identified that require aligning in order to
create a winning marketing plan.

The marketing module was developed to help participants develop a marketing plan for
his/her own product/service or new idea. It created a test bed to work out all aspects of getting a
product or service to the market and then developing the marketing approach to achieve the
desired market share. The framework for the plan allows the manager to develop their marketing
knowledge and understanding to develop the skills to apply it to a product or service.

In the questionnaire results – where people stated that they could not apply it, it was
discovered that these people did not have a direct role in the marketing process.

The areas covered in the marketing planning module include:

• Market analysis – development of a simple framework to measure the estimated size and
  share within a market or segment of the market.
• Sales projections – understanding how to represent market shares in terms of cashflow
  and sales activity.
• Marketing strategies – using a framework to define your strategy.
• Product positioning – understanding how to use basic techniques to measure the product
  or service against customer needs, market share and growth rate and the time required
  for market growth or maturity.
• Tactics – learning how to build a portfolio of elements to penetrate or develop the market
  and be able to cost these out.
• Competition – understanding frameworks to evaluate the effect of competition and the
  effect your product or service will have on competition.

Outcomes

• Preparation and the development of a strategic marketing plan for any product or service
  linked to the resource base of the company.
• Development of a policy for the company that will allow other people to create or be
  involved in the creation of marketing plans and elements of marketing plans.
• Identification of further needs for the product or service and the implications for the
  business.

Appendix 3. Contents of the product development module
The aim of this module is to develop the skills necessary to manage the product development
process and create world class innovative products and services. At the same time, a major
outcome is the creation of a framework and range of policy statements for the product development process within the organisation. The module provides tools to analyse the current product development process and measure its performance. It places emphasis on the creativity, customer focus, the technical and quality hurdles, and the ways to organise development projects from concept through production to the cost elements of manufacture and development.

The product development module was initially introduced through the pilot as a theoretical case study approach. The questionnaire results show that in all cases participants improved understanding but did not apply it to the workplace. Over the past year the request by government agencies and managers has been to integrate the product development process into the market-planning module. This has now led to an integrated module that looks at getting a product to market in shortest lead times to developing the marketing to suit product and company.

It was also recognised that many service-based companies are solution driven and run projects. Discussions facilitated within new groups is now leading to a much greater understanding of the project management side of bespoke projects and internal product development projects for the company to take to market. This also refocuses the manager to look again at the structures to facilitate this approach, which are often classed as non-structures. This emphasised the need for tools and techniques to develop small project teams create the climate and gain productivity in terms of timescales.

The areas covered in this module include:

• New product development – understand how to set product development policy, within the framework of your company’s strategy and what to do to generate and select ideas and build a creative mechanism in the organisation.
• Concurrent engineering – learn how to develop the skills for a truly integrated and innovative organisation.
• Quality function deployment – understand the methodology to objectively collect and use market information to optimally determine product or service specifications and features.
• Costing of projects – understand how to look at cost and control this in the project and manufacturing phase. Emphasis will cover product launch costs and integrate with marketing the product.

Outcomes

• Develop a policy for the new product development process that will provide the framework for higher levels of creativity and idea generation.
• Create a climate for greater integration and sharing of issues and problems throughout the organisation.
• Identify the core skills to improve levels of productivity at the project development stage.
• Create a cost framework for project approval stages to look at returns on investment.

Appendix 4. Contents of the financial planning module
The aim of this module is to develop financial skills that create an understanding of finance from the strategic perspective of the business and develop the performance measure for sustained growth. At the same time, a core aim is to analyse the financial performance of the business in the current state, develop the performance measures that are required to grow the company and make policy decisions that allow for financial control of a growing business. The emphasis of this module is to provide a framework for financial analysis of a company.

This module was developed last and results from the questionnaire show that this has the least impact in the workplace. This appears to be due to the module being less interactive. Also, it is case study based and difficulties may come from sharing confidential accounts information. The first pilot involved small groups of people running their own business. The focus was on
theory and a case study that involved participants trying to contain the financial performance of the business under different situations. These situations were typically related to setting up offices overseas as part of an export drive, or developing a product for a new market place. Further development of this module is underway with new tests revealing higher learning levels with the emphasis placed on strategically analysing the financial performance of the company and relating to key aspects of management and the company performance.

The modules cover the following areas:

- Ratio analysis – understanding core areas of the business that let you know how well different parts of the organisation are performing.
- Financial reporting – learn about different financial structures to suit different organisation types from the divisional to the innovative one.
- Growth measures – understand the link between goals and visions within a company and the budgeting and cost control within teams, units or division.
- Performance measures – learn how to set measures for growth that relate to shareholders, sales, profits, cost, remuneration, reporting and investment in products, markets and acquisitions.
- Funding and taxation – develop policies for funding different growth scenarios, the taxation aspects for growth and the raising of funds.

Outcomes

- Analyse a company from the strategic perspective in relation to performance of the people running the company.
- Develop performance measures that link to structure, product, markets, people and management.
- Create a framework for your organisation and the performance measures for sustained growth.
- Understand the finance issues for growth.

(Chris Blaydon, Management Development in SMEs programme. Chris has extensive experience of working with SMEs in the development of their senior management teams, and in the delivery of management development programmes. Prior to joining the University she was a senior executive with Grampian Enterprise where she was responsible for the development and management of the Science Parks Management Development Programmes, and for Human Resource Development within technology-based SMEs. Chris’ research focuses on Management Development within innovative HTSFs.

Professor William Keogh, Brisco Chair in Entrepreneurial Studies. Bill is the co-ordinator of the postgraduate programme. He has management experience in a number of industries; principally in whisky, food and home improvement. He is a Director of the Institute of Small Business Affairs (ISBA) and has published in areas relating to innovative SMEs. He is also a Fellow of the Institute of Management Services (FMS), a Fellow of the Institute of Quality Assurance (FIQA) and a Fellow of the Royal Society for Arts, Manufactures and Commerce (FRSA). His main interests lie in working with, and researching, Entrepreneurial SMEs; more specifically - Innovation and Entrepreneurship, Total Quality Management, and Operations Management in HTSFs.

Professor Gary Evans, Chair in Innovation Management, Management Development in SMEs programme. Gary has substantial experience in the management of technology-based SMEs and in the commercialisation of research, gained in Europe and the USA. He has also been involved in the development and management of a range of publicly-funded support mechanisms such as science parks, incubators and innovation centres, and founded the Grampian Technology Development Unit, which provides support to local SMEs in the development of new products. His main areas of research interests are new product development and the management of HTSFs - from inception to establishment in the marketplace.)