

# B.4

## Supervising engineering students

1. The supervision process at the stage of a MS/BS thesis  
- Supervising an individual/a group
2. Volunteering and/or preparation for a professional career
3. Action and research preparation and following up
4. Field work preparation and following up
5. Academic reporting and feedback to stakeholders and society



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Front Cover Photo: Project identifying habitat issues in the suburbs of Dakar, Senegal. Carola Luna Torres

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PHOTO: Action research project to improve the habitat in the oasis of M'Hamid EL Ghizlane, Morocco. Carola Luna Torres

## CHAPTER

# 1

# The supervision process at the stage of a MS/BS thesis - Supervising an individual/a group

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# 1

## THE SUPERVISION PROCESS AT THE STAGE OF A MS/BS THESIS - SUPERVISING AN INDIVIDUAL/A GROUP

**Mike Clifford**, University of Nottingham

### EXECUTIVE SUMMARY

This session considers the challenges and benefits of supervising undergraduate research projects in the field of Humanitarian Engineering. An emphasis on intended learning outcomes rather than project outcomes is useful in assessing the student's performance. Appropriate Technology projects may appear to be less complex and demanding in a technical sense, but including social, cultural and economic aspects adds to the student's workload. The multi-disciplinary skills developed are key to fostering independent learning, which enables students to have an appreciation of the global context of engineering.

## LEARNING OUTCOMES

After you actively engage in the learning experiences in this module, you should be able to:

- Get a set of good advising practices.
- Identify actions that may negatively affect the supervision of students.
- Know the main differences between advising an individual and a group, and learn how to stimulate the best results from them.

## KEY CONCEPTS

These concepts will help you better understand the content in this session:

- Supervision process as a coaching process
- Steps or best practices in coaching/supervising students
- Supervising groups versus supervising individuals

## GUIDING QUESTIONS

Develop your answers to the following guiding questions while completing the readings and working through the session:

- How would a Humanitarian Engineering project meet my project intended learning outcomes?
- What additional challenges would such a project involve for the supervisor?
- What additional challenges would such a project involve for the student?
- How will the project be assessed compared to more traditional projects?

## INTRODUCTION

The role of academic supervisors in the field of Humanitarian Engineering is not just about providing expertise in the specific field of the student's thesis (e.g. hydraulics): a major attention is required on the global dimension of the work, including social, cultural and economic aspects and impacts of the thesis. Supervisors should assist candidates to complete the thesis on time and to work as professionals, providing results that can be easily applied in the field.

This is the first session within the GDEE course module that aims to prepare academics to support students to carry out field work for undergraduate and Master's thesis projects. It will prepare participants for the next four sessions in the module, which each cover different logistical and practical aspects of field work, including different research methods used in the field and health and safety issues.

Supervising Undergraduate and Master's thesis / dissertation projects can be a very rewarding and rich experience. On many degree programmes, students are taught in large classes and rarely have the one-to-one contact with an academic afforded by an individual project. Conversely, students can find the project a difficult and challenging experience; did they choose their own project / tutor, or were they placed with an academic who has very different expectations from the project and appears to offer little support?

There are many resources which discuss the joys and sorrows of supervising individual and group dissertations (see references and bibliography). However, supervising projects in the field of International Development / Humanitarian Engineering / Appropriate Technology brings additional challenges and rewards. The following Table lists some of the areas that we will consider.

**Table 1** *Some of the rewards and challenges associated with Humanitarian Engineering dissertation projects*

| TOPIC                             | REWARDS  | CHALLENGES   |
|-----------------------------------|--|--|
| Making a Difference               | The project offers the student the chance to tackle a “real world” problem.  | The solution is unlikely to make an immediate positive impact to a specific community.             |
| Appropriate Technology            | Technical solutions must use readily-available items and simple tools.   | The final design may look like it could have been made in a garden shed.                           |
| Multi-Disciplinary Skills         | The student will have to consider social, cultural and economic aspects as well as core engineering.               | Where will the student find support in these areas?  |
| Individuality                     | Individual projects offer students the chance to work independently on a project of their own.                     | The project dissertation can be a lonely task for students who are more used to working in groups. |
| Field Work – to go, or not to go? | The project may offer the chance for the student to conduct field work in an unfamiliar location.                  | Lack of funds and practical considerations may make field work impossible.                         |
| Is this Engineering?              | The dissertation will expand the student’s horizons to see what difference engineering can make in the real world. | An independent marker might be concerned by a lack of “real” engineering in the thesis.            |

## MAKING A DIFFERENCE

Many students are attracted to the field of International Development / Humanitarian Engineering because they want to “make a difference” and to tackle problems that affect the lives of people in remote communities. Indeed, **Engineers Without Borders UK** describe themselves as “an organisation that creates massive small change by empowering thousands of new engineers to remove barriers to human development”. The difficulty here is that problems that affect the lives of people in remote communities can rarely be fixed overnight by technology alone. In particular, it is perhaps unrealistic to expect the results from an undergraduate project to make an immediate positive impact to a specific



community. Just as human development takes time, technological development also has a long and complex gestation period.

These difficulties leave us with two options; either not to tackle International Development / Humanitarian Engineering projects at all, or to emphasise the limitations of the research at an early stage to all parties concerned. This is particularly important if a project has a specific community in mind. It would be better not to promise too much to the recipients of a project in advance without making them fully aware of the scope and capabilities of the dissertation beforehand. I learnt this lesson the hard way. The first project I supervised in this field was the design and construction of a bread oven for a village in Uganda. Although the project produced a working prototype oven, on reflection, it added extra stress to both the students and to the supervisor.

One way to get around some of these issues is for students to carry out project work with more a generic focus, such as the design and construction of a heat retaining solar oven, without a specific target community in mind, or perhaps with a specified region mentioned – e.g. “a small-scale water purification system for Sri Lanka”.

It is vital to keep the intended learning outcomes of the dissertation in mind. These are unlikely to focus purely on the artefact that comes as a result of the project, but will probably concentrate on the design methodology, the successful planning and execution of a project and so on. The skills that students develop during the project are also much more important than the final outcome in terms of employability.

## APPROPRIATE TECHNOLOGY

The Appropriate Technology Sourcebook (Darrow, 1993) suggests some general characteristics that tools and techniques must possess to be in keeping with Appropriate Technology. These include:

- Be low in capital costs.
- Use local materials wherever possible.
- Create jobs, employing local skills and labour.
- Be small enough in scale to be affordable by a small group of farmers.
- Can be understood, controlled and maintained by villagers, not necessarily highly educated.
- Equipment can be produced out of a small metal working shop, if not in a village itself.
- Make technology understandable to the people who are using it.

As a result, engineering solutions that follow these guidelines may look less impressive than the results of dissertations in other more mainstream areas of engineering. Again, the emphasis should be on methodology rather than on outcome. If the design process has been followed and the material selection can be fully justified, given the budgetary constraints and local availability of resources, students should not be penalised for producing elegant yet simple devices / artefacts.

Working with alternative materials can pose additional hurdles, with most university workshops being more used to dealing with metal than wood. If materials are being recycled, it may be difficult to obtain Control of Substances Hazardous to Health (COSHH) datasheets. Projects which focus on the properties of local materials (such as determining the tensile strength of various grades of bamboo) must ensure that these materials can be readily sourced and transported to the test facility. This may require an import licence.

## MULTI-DISCIPLINARY SKILLS

When undertaking a project in Humanitarian Engineering, it is vital to consider the global dimension of the work, including social, cultural and economic aspects of the thesis. This is a good opportunity for students to put their engineering into context. One tendency is for students to only pay a little attention to the context in the introductory section of their thesis and to ignore the constraints and opportunities provided by a specific location in the rest of their dissertation. For instance, the design of a solar power station for a village in Nigeria might just take the power requirements for the community and base all the design calculations around these figures, without considering the local availability of materials, the terrain, the ownership of land and property, community involvement, the political situation, finance options, scale of electrification, weather conditions and so on.

Understanding the local context and the global dimension is not something that comes easily to engineers, particularly when some factors cannot be easily quantified. Supervisors may also lack the necessary background to fully support students in these areas. One solution is to draw upon expertise across the University. Making links with colleagues in Geography, Politics, History and so on, may also be beneficial in terms of facilitating future research funding.

## INDIVIDUALITY

Individual projects offer students the chance to work independently on a project of their own. Some students thrive given the chance to carry out substantial work on their own and will develop their independent learning as a result, but the project dissertation can be a lonely task for students who are more used to working in groups. This issue is common to research dissertations in all fields of engineering (and beyond). However, students working in

Humanitarian Engineering can feel especially isolated when they compare their progress with projects that their peers are undertaking. Students may need to be reminded of the intended learning outcomes for the project to avoid them from making unfair comparisons with their peers who may be carrying out more “high-tech” research.

One trivial example that I tell my students is a project carried out by two students to turn lead into gold. The first student is told by their supervisor to go to the lab, to place some lead into a certain machine and to turn the handle until gold is produced. After obeying the instructions, the student produces a solid gold bar. The outcome is spectacular, but the student hasn't developed any high-level skills in the process, so the overall mark for the dissertation could well be quite modest. The second student takes a different approach. She reads the literature, carries out a number of material characterisation techniques, locates some additional equipment in a different department and so on. After much reading and many experiments, she concludes that it is practically impossible to turn lead into gold. Her project outcome is disappointing, but in the process she has carried out a good quantity of independent research, read the literature and met many of the intended learning outcomes for the project module. As a consequence, she receives a high mark. (The supervisor, on the other hand, is given a stern talking to for setting impossible tasks!).

Humanitarian Engineering projects may well be speculative. As we have already discussed, the project outcome may not be a success in terms of an innovative solution that makes an immediate positive impact. However, students need to be reassured that if the project intended learning outcomes are met, their work will be rewarded fairly.

## FIELD WORK – TO GO, OR NOT TO GO?

Issues surrounding field work will be discussed at length in a subsequent session in this module. These projects may offer the chance for the student to conduct field work in an unfamiliar location, but lack of funds and practical considerations may make field work impossible. For instance, for final year undergraduate projects, the dissertation may take place alongside other taught modules, making it impractical to spend any length of time away from the host institution.

Several alternatives exist. These are as follows:

1. The experience gained during summer placements carried out before the project commences can inform and even inspire the selection of a project. For instance, an EWB-UK summer placement in Southern India inspired one of my students to come back with an idea for a group project to develop a novel cook stove for a particular community. A prototype was designed and tested and the

student took the final design back to India for further development after graduation.

2. Masters students from abroad may wish to spend their summer back home and could use the time to carry out field work. If this is the case, suitable arrangements need to be put in place for remote supervision (e.g. regular Skype meetings). Consideration must also be given to Health and Safety.
3. It may be possible to use the experience from field work carried out by others. This could come via the literature, or be gained by interviewing field workers from Non-Governmental Organisations who have returned to the sending country.

## IS THIS ENGINEERING?

Although a project in Humanitarian Engineering will expand the student's horizons to see what difference engineering can make in the real world, more traditional colleagues may turn their noses up at a lack of "real" engineering in the dissertation / thesis. This can be problematic when it comes to appraising the student's work. Again, it is important to emphasise the importance of the intended learning outcomes for the project module and for supervisors to check that projects proposed by themselves or suggested to them by students are capable of meeting the intended learning outcomes. Simplicity should be rewarded, not penalised.

Occasionally when my colleagues see that my research field is "appropriate technology" they ask if their research is "inappropriate technology". A similar difficulty exists when classifying some research carried out in a department or an institution as "sustainable" which tends to imply that research in the rest of the institution is unsustainable. There is a sense that all research should be both appropriate and sustainable. These terms should cover the majority of projects, not just a small sub-set for environmentalists and do-gooders. Understanding the global dimension should not be an optional extra.

## CONCLUSIONS

The supervision process for Humanitarian Engineering projects brings with it many challenges that are unique to the field. Engineers may only be partially equipped to supervise and to assess these dissertations. In such cases, good use can be made of colleagues from across the University and possibly from outside agencies. As well as the challenges, such projects also bring rich rewards in terms of enhancing the student experience and developing transferable multidisciplinary skills that may not be widely covered in the traditional engineering curriculum.

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# CHAPTER 2

## Volunteering and/or preparation for a professional career

PHOTO: Implementing new infrastructure alongside the retraining of locals in the Xipamine market area, Maputo, Mozambique.  
Sara Thabit

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# 2

## CHAPTER 2. Volunteering and/or preparation for a professional career

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# 2

## VOLUNTEERING AND/OR PREPARATION FOR A PROFESSIONAL CAREER IN INTERNATIONAL COOPERATION

**Massimo Zortea**, University of Trento

### EXECUTIVE SUMMARY

In this chapter, we will explore in more detail how to help students apply their scientific and technical preparedness acquired in higher education courses. After a general overview of the principal opportunities for practical experiences in international cooperation, the benefits of those experiences will be highlighted. Individual motivations towards such demanding initiatives will also be explored. This chapter will outline a method for initiating students in these experiences. The method identifies student requirements and links them to those of the international cooperation organisations - both governmental and non-governmental - whilst acknowledging respective differences. Finally, this chapter explores how to orient the monitoring, supervision and evaluation of students' experiences (during and after) towards non-formal and non-formative professional capabilities and human qualities.



## LEARNING OUTCOMES

After you actively engage in the learning experiences provided in this module, you should be able to understand how to:

- Make students aware of the opportunities for practical experiences in international cooperation and the value of such experiences;
- Focus and strengthen individual motivations towards such experiences; Support students in initiating these experiences, helping them to identify their own demands and aligning them to those of international cooperation organisations, both governmental and non-governmental, whilst recognising respective differences;
- Monitor, supervise, and appraise their experiences,, and orient them towards the acquisition of non-formal and non-formative professional abilities and human qualities.

## KEY CONCEPTS

These concepts will help you better understand the content in this session:

- Governmental organisation and non-governmental organisation;
- International volunteering, professionalism and demi-professionalism;
- Individual motivations;
- Envisioning, counselling, coaching, mentoring, matching.

## GUIDING QUESTIONS

Develop your answers to the following guiding questions while undertaking the readings and completing the session:

- What learning outcomes do you want to develop in students through the preparing for, and involvement in the experience? What is the reason for the experience; (what are its aims and objectives)?
- When – or at what stage of learning – would the experience be beneficial to the student?
- How and when should students plan/engage in/evaluate an experience?

## INTRODUCTION

Sustainable Human Development (SHD) processes are characterised by an elevated importance given to a “**Human Resources**” component and to all aspects inherent to the abilities of individuals, alone or collectively. Such abilities are always the fruit of a process of construction and growth that demands suitable planning and supervision.

Therefore, the development of Human Resources in all of their components and iterations is at the same time a **goal** and a **means** of SHD processes. Additionally, it represents a clear and moderately reliable **indicator** for the success or failure of such processes or, more precisely, the initiatives directed to promote such processes, whether they be political strategies, immense programmes, or one-time projects.

This triplex value also implicates the necessity and utility, on one hand, of using the project approach to plan the evolution of the student-person, in all of its components, both technical-scientific and human, and on the other hand of monitoring the difficulties involved in order to draw conclusions useful to the project. In this sense it speaks of an “**educational project**”, far broader than mere training.

It’s a fact of common experience, even if not always perceived in all of its didactic-educational potentialities, that Human Resources grows through concrete working **experiences**, in which theory can be applied to daily reality and concrete situations. But often this awareness is not reciprocated by a commitment from the most diffuse educational agencies, including universities, to plan and to actively accompany these experiences in individualized way, i.e. suitable to be most effective and profitable for every single student.

Thus the importance of knowing **containers** and **contents** of those experiences emerges, to best direct students towards sponsoring entities and experiences most suited to their inclinations. Among the distinctive aspects that may differ remarkably from one experience to the next, we can enumerate on one hand, regarding the corporate body: values, principles, styles, institutional purposes, rules, procedures of admission, etc.; on the other hand, regarding the experience: the geographical, social, political, economic, cultural, environmental context

The **Teacher’s role** is essential, and it requires that he/she take on multiple activities for students, preparing himself/herself and mastering a whole host of abilities, which we will discuss in detail.

## VOLUNTEERING AND WORKING IN INTERNATIONAL COOPERATION

First job experiences, voluntary or remunerated, in the field of International Cooperation – i.e. the initial working experiences tailored to professional training – represent a great opportunity for honing one's university preparation and maturing under a profile both professional and human. They also constitute a natural element of linkage between the academic curriculum and entry into the professional sphere. Nevertheless, they display several peculiarities that make it necessary to know certain—mostly practical—features in depth and in advance, for which the aspirant must be adequately prepared.

But what are these features? The three most remarkable are, in the author's opinion: the types of initial experiences and long-term results; the value of the experiences (why they are worthy); their final utility and therefore purpose.

In the first item, we can distinguish three types of **initial experiences**:

- voluntary working experiences (e.g. international volunteering), characterized by individual motivations of liberal inspiration, i.e. not aimed at achieving economic utility, not remunerated or at the least not remunerated proportionally to the volunteer's performance;
- other working experiences, designed to achieve formative utility; e.g. stage, apprenticeships, post-degree professional specializations, research grants etc.;
- other working experiences linking the formation and research world with the professional world.

It should also be kept in mind that in International Cooperation there are three distinct forms of **professional activity** (in the sense of continuous activity requiring specific professional competence) :

- long-term international volunteering
- professionalism
- demi-professionalism.

The first is a long-term experience (two years or more) in which the person is expected to perform duties that can be very demanding, due either to the conditions he/she faces or the level of responsibility he/she assumes, but based on a free individual choice not tied to economic considerations. This doesn't mean that the volunteer cannot receive support in the form of economic benefits or logistical and financial endowments that guarantee him/her a comfortable subsistence (food, lodging, pocket money). The international volunteer is not a

dilettante; but he/she lacks a contract that remunerates him/her proportionally to his/her performance in service of the organization that sponsors him/her.

The second form is a stable and exclusive choice in the field of International Cooperation: a real contract of employment or for professional services rendered autonomously is stipulated, with varying duration (short-, medium-, or long-term, or even open-ended), varying location (in the same country, in a developing country, or in third countries), and varying contents (either conforming to the contractor's specific qualifications, or, more often than not, partially or totally unrelated to their training and prior experiences).

In the third case, less known among the public, but in reality very frequent, professionals who are stably employed in their own country or abroad, in a field other than International Cooperation, dedicate a part of the year or a few days a month or hours a week to projects related to International Cooperation: e.g. an engineer who operates in Europe but plans and supervises the construction of schools and clinics in developing countries on behalf of an NGO.

As for the value of such experiences, it must be said that – regardless of personal motivations and the specific finalities that inspire them – they are not only instrumental for professional formation or for a professional debut; they represent a **value** in themselves, given the personal enrichment that they generally bestow on participants. In general, technical and ethical higher education are two essential components of education for active citizenship, which constitutes a fundamental ingredient of SHD processes, at whatever latitude.

Last but not least, it is necessary to be aware that the **final utility** of those first experiences is manifold and can be maximized only through the focused preparation and cultivation of every aspect of the candidate:

- i. vocational verification (genuineness and depth of motivations in a candidate aspiring to a more definitive commitment to International Cooperation);
- ii. orientation in professional specialization (discernment in the more definitive choosing of thematic sectors, geographical position, typologies, and level of duties etc.);
- iii. refinement of competences and professional ability, both specific and complementary, formative and non-formative (i.e. not transmissible with formal didactic channels), and human;
- iv. construction of professional and personal relationships as well as creation of a network of contacts and focal points useful in future professional experiences.

Besides this main thematic trio, there are also **further remarkable** aspects to keep in mind in order to effectively plan similar experiences: e.g. preliminary requisites to be able to face

these experiences; necessary competences; professional pathways and results produced or favoured by those experiences (concrete content of the activities, sectors in which to work, etc.); contexts, objectives, and tools applied by the organizations or other entities hosting the experience, in whose framework the experience must be placed. In this chapter, of course, it's not possible to explore all these aspects in detail, since their operational character they would require a separate analysis in each professional field or thematic sector. In the part devoted to the teacher's role, some tips for in-depth analysis will be provided.

If we keep in mind all these components, **what** is necessary **to develop** before, during, and after the experience you are planning appears more clear. Two levels, complementary but separate, can be articulated:

- preliminary competences and capabilities, preparatory for the experience, that also constitute a requisite and a presupposition for obtaining good results;
- competences and capabilities deriving from the experience, useful for the exercise of the definitive profession or for future working experiences.

Secondly, the **goals** that can be pursued with the various typologies of experiences mentioned above begin to emerge. Some of them are also accumulable. We can enumerate: professional formation/updating; maturation/refinement of personality; creation/expansion/updating of the network of contacts and professional and personal relationships; completion/improvement of university formation; professional re-training and life-long learning.

It's useful to underline that the precise **contents** of the working activity can be the most various and are not necessarily connected with the specific knowledge acquired in the academic career undertaken by the student up to that date and therefore with those imparted by the teacher. In other words, the student can also choose to develop activities extraneous to his/her actual degree or to the single course managed by the teacher promoting his/her experience. Synthesizing the casuistry in broad strokes, we can distinguish three options:

- a) the student develops activities pertinent to his/her own specific field (e.g. an environmental engineer plans and realizes artesian wells for the distribution of drinkable water);
- b) the student develops activities in a complementary field (e.g. an environmental engineer teaches in a local technical institute or university how to plan and to realize artesian wells);
- c) the student develops activities in an extraneous field (e.g. a surgeon teaches foreign languages).

In practice, these three situations can overlap, if the same individual manages activities pertaining to two or three of the situations just described. Often, the individual perceives the need or the opportunity to apply him/herself beyond the specific duties he/she has already assumed; but it is not uncommon for him/her to choose option b) or c) from the outset.

Another aspect to be attentively considered and programmed, both by the student and the hosting organization/corporate body, are the **times** of the experience, referring both to the **duration** and the **scheduling** of when the experience is to begin.

As for the first point, it must be said that the duration fundamentally depends on the type of experience. In case of experiences with a primarily formative purpose we can distinguish at least 4 typologies with as many different durations:

- i. cognitive / exploratory experiences (0-2 months; e.g. the "Stage of Project" with surveys and on-site planning in a developing country, in the homonym official course promoted by the University of Trento, UNESCO Chair in Engineering for Human and Sustainable Development; or the team summer experiences in developing countries promoted by many NGOs);
- ii. first apprenticeship (3-6 months);
- iii. professional apprenticeship (up to 1 year);
- iv. specialization (up to 2 years or more).

The second point refers to a determined moment in which it is opportune or compulsory to initiate the experience. In order to ascertain when to realize an experience it is necessary to evaluate the concrete circumstances, the student's formative curriculum, and his/her degree of maturity, both technical and human. In general, however, there are three orders of factors that influence the scheduling of an experience. Sometimes it depends on the student's formative curriculum or on the university/formation centre in which he/she was trained (some phases favour embarking on a project: e.g. while preparing the thesis or an exam, as in the case of the Stage of Project above quoted; while other formative situations do not overlap with the accumulation of firsthand experience, such as a demanding study plan, a semester chock full of examinations, a PhD program that begins immediately after graduation, or a national exam or qualifying examina the student must prepare for). Sometimes it depends instead on the student's personal career (e.g. his/her family situation; current professional proposals ; an insufficient level of maturity to face demanding experiences abroad). Other times, it depends on the hosting organization/corporate body (e.g. dates of calls for proposals, duration of selection procedures, delays on the project the student will participate in due to a lack of authorizations, financing, agreements with partners, etc.).

Furthermore, the **execution modalities of the experience may differ**. First of all, it can be an individual or group experience; in the latter case, it can be a homogeneous group in terms of nationality, age, professional formation/competences, organization of origin; or it

can be a heterogeneous group. The project can be accompanied by a teacher or a tutor from the university, the hosting organization, or from a corporate body; but more often no accompaniment is provided (sometimes even simple tutoring or support from the student's country of origin are lacking). Furthermore, the project can receive on-site logistical support (e.g. lodging and food guaranteed), assistance from local personnel; or no support at all. It is clear that – according to the degree of individuality of the experience, the heterogeneity of the group, and the presence or absence of on-site accompaniment and /or assistance - difficulties for the student increase and can heavily impact their experience; but they often turn into a strong stimulus that enriches the individual and represents an added value even at the formative level.

A further factor regards the **places** and **situations** in which the experience is realized. Various alternatives can be distinguished by:

- type of **geographical place**: the project can be domestic or international; static or itinerant, with two stops or more; permanent or structured for missions on the spot, or with a stable base that supports mobile missions or missions in other locales; in an urban or rural zone; in populous or deserted areas; in the temperate zone, sub-tropical zone, arctic zone, etc.; the distinctions could go on, but for the present chapter we must limit ourselves to a few examples;
- type of **operational place**: generally the distinction is between experiences in a headquarters (i.e. at the central base of the hosting corporate body) or in the field (i.e. in peripheral zones where the project or operational, institutional activities take place);
- type of **hosting corporate body**: the most common distinction is among so-called Governmental and Non-Governmental Organizations; or among State Actors and Non-State Actors. In the first dichotomy, the division is between public or private corporate bodies; in the second one, between the national or supranational level (government, ministries, national public agencies, international federative or multilateral entities such as European Union etc.) and the sub-national level (local authorities, regional agencies, private entities both profit and non-profit). One must attentively distinguish the various typologies of entities, since the differences heavily impact the concrete characteristics of the experience, under varied profiles: places, duration, contents of the activity, treatment, criteria of evaluation, disciplinary rules, prestige etc. The structural and functional differences among all these entities are numerous and it's not possible to exhaustively enunciate them here. Among other distinguishing features, we can enumerate: values and inspiring principles (vision), institutional mandate (mission), styles of internal and external behaviour, internal rules and procedures, requisites of admission, areas of intervention, thematic sectors, financial and technical means as well as available human resources.

It is interesting to highlight that – even between entities and organizations of a similar nature, such as international NGOs or governmental development cooperation agencies – differences often subsist in the forms of recruitment, the treatment of recruited subjects, and the way the individual and team activities and experiences are managed. Thus, the duration or contents of the activities (e.g. emergency medical activity in zones struck by natural disasters) being equal, frequently two or more students will conclude their experience with opposite results, one feeling satisfied and another disappointed.

After this long formulation, in which all the aspects to be considered in planning and implementing an experience have been reviewed, it is finally possible to analyse the **teacher's role** in this process.

First of all, it's useful to describe in detail the contents of this role. The teacher is called upon, with a sense of initiative, creativeness, and participation in the outcome of the student's educational pathway, to assume the followings **active assignments**:

1. to open ample horizons for students revealing the opportunities of preparatory experiences and the subsequent careers as well as the possible choices;
2. to point out concrete careers they can inaugurate;
3. to actively motivate students;
4. to accompany students;
5. to mediate among students and entities/organizations.

Now we'll see concretely what these five assignments mean.

#### 1. To open ample horizons for students revealing the opportunities of preparatory experiences and the subsequent careers as well as the possible choices (envisioning)

The teacher should endeavour to offer to students an overview of the following themes:

- International Cooperation (principles, values, goals, fields of action etc.);
- actors and entities working in International Cooperation, enlightening the different visions, missions, styles, rules, objective, operational formality, etc.;
- professional profiles demanded in International Cooperation and possible careers.

Of course, it's useful and recommendable to organise ourselves so as to unite forces with other teachers, in order to maximise the fruits of preparatory work. For instance, it can be useful to organise an annual informative event on these topics, to which students from the entire department or even the entire university are invited. On such occasions, managers or



officers from international organisations, government authorities from the national or local level, and even operators in the field, external consultants, and experts can be invited to speak; likewise, participation and testimony from representatives of international or even local NOGs will be useful.

It seems opportune to expand on the main **concepts** and **definitions** concerning international organizations, also in order to help the reader to have a more complete view of the truly variegated contexts in which experiences for his/her students can be promoted and realized.

An **international organization** can be defined, according to international law researchers, as a voluntary aggregation of international citizens, established through international acts and ruled by international law, that is constituted as a stable corporate body, provided with an internal juridical arrangement and endowed with proper organs and institutes, through which it effects common purposes among members by means of the explication of particular functions and the exercise of powers that are conferred on it for that aim. It is therefore characterized by the management of a collective interest shared within an international community and the performance of an international public function, in which it replaces single subjects and thus manifests a consortial nature: it pursues its members' goals and in their substitution, acquires an autonomous international juridical personality and also comes into contact with third parties. Its mission can have a technical or political character. Some treaties also contain official definitions of the international organization; see for instance the *United Nations Convention on the Law of the Sea* (UNCLOS, Montego Bay 1982, art. 1 of Annex IX).

It is important to underline that the composition and functioning of its internal structures, and more generally all its internal and external dynamics, are inspired by the need to reconcile the tension between the affairs of particular associates and collective stakes, and seek a synthesis. The social importance of international organizations must also be underscored, as this factor indirectly impacts the modalities of professional daily practice; it therefore must be brought to students' attention as they embark on working experiences with such an organisation. International organizations engage in activities that bring them into ever increasing contact with individuals from different nations, surpassing the territorial borders of States and with them the frequently concomitant local privileges and prejudices. Thus they contribute to a better mutual understanding between people of different origins and cultures and, as such, they are a great impetus for the advancement of civilization; therefore specific abilities pertinent to such precious task are required of those who would operate within them, such as linguistic, communicative, and interactive skills that are transmitted in a formative pathway that is necessarily technical and human at the same time. Additionally, it's useful to conduct a brief review of the various **typologies of organizations** working in International Cooperation and of the professional profiles encountered among their staffs or otherwise involved in their activities.

The principal distinction - well known even among the general public – is between **Governmental Organisations and Non-Governmental Organisations**, grounded on the public or private nature of the corporate body and its powers. Another distinction frequently used in the context of International Cooperation is between State Actors and Non-State Actors (NSA), but in this chapter we lack the space for a closer examination. In brief, we can highlight that the latter dichotomy refers both to physical people and to corporate bodies. A State Actor is defined as a person or organization that plays a role in politics and directly represents the governing power of a State and/or receives direct, obligatory direction from a State (to them Local Authorities are united, characterized by having functions and public powers at a sub-governmental level). The term, Non-State Actor, includes all the non-sovereign entities that exercise significant economic, political, and social power and influence at a national and in some cases international level: for instance, multinational corporations, NGOs, international media, violent groups, religious groups, transnational diaspora communities ,etc.

Governmental Organisations are constituted by States or supra-state corporate bodies and are subject to international law. NGOs, on the other hand, are organizations constituted by private subjects (if international, they belong to multiple States) and that, though they implement activities in multiple States and territories, are regulated by the laws of the specific State in which they are legally registered. They can be animated by a variety of different visions (both in terms of ideals and inspiring principles, and in terms of their conception of international relations and the ways and means for managing them) and their missions, i.e. institutional purpose, can be disparate (humanitarian, religious, political, scientific, social, environmental, athletic, etc.). They can have a regional or global sphere of action. Therefore they usually comprise private subjects who submit to an internal juridical arrangement. Non-Governmental Organisations are frequently non-profit, i.e. not motivated by gainful pursuits, even if they often attend to the interests of their associates, including on an economic level, as in the case of sectorial international associations (transportation, commerce, industry, services, agriculture, professional activities, etc.). The general definition, however, is phrased in negative terms: not being founded upon international agreements among States and not exercising public authority, or endowed with public powers. The definition adopted by the UN ECOSOC Economic and Social Council is illuminating: "any international organization which is not established by an inter-governmental agreement" (see Resolutions nr. 288/1950 and 1296/1968). The European Convention on the Recognition of the Legal Personality of International Non-Governmental Organisations represents an important definitional effort s (1986 Council of Europe, taking effect 1991), when it describes those organizations that "carry out work of value to the international community, particularly in the scientific, cultural, charitable, philanthropic, health and education fields, and that they contribute to the achievement of the aims and principles of the United Nations Charter and the Statute of the Council of Europe". NGOs can enjoy, in certain conditions, a consultative status at the United Nations, as at other international

organizations, global or regional. In particular, Article 71 of the charter of the United Nations provides that ECOSOC “may make suitable arrangements for consultation with Non-Governmental Organizations which are concerned with matters within its competence”. ECOSOC has refined the stipulation with several resolutions; including a significant decree issued on 24-07-1996 governing the participation of NGOs’ in international conferences promoted by the United Nations, and allowing them to develop an active role in the preparation, development, and finalization of international debates and of normative texts that result from them. In this vein, one of the most recommendable experiences for launching a professional career in International Cooperation is to attend such a conference as an observer. To do so it is necessary to get special accreditation, demonstrating membership in a recognised organisation. Even universities are admitted, usually under the category of "Education". Accompanying a small group of students to an international conference is an experience this author heartily recommends to all teachers.

As authoritatively noted by the Italian researcher, Ugo Draetta, under a modern lens and in a world in continuous transformation, in which individuals assume an increasingly international role, International Non-Governmental Organisations respond to the diffuse demands that internationalisation exercises on the lives of individuals. By constituting International Non-Governmental Organisations, individuals participate in international public functions to the extent that such organizations intensely collaborate with Governmental Organisations for the attainment of their goals. Employing a better articulated but still general classification based on a geographical/spatial criterion, we can distinguish among:

- international public organisations and corporate bodies (for instance, agencies of the United Nations or EuropeAid in the European Commission);
- national public organisations and corporate bodies (for instance, foreign affairs and/or development cooperation ministries, national development cooperation agencies); cooperation ministries, national development agencies);
- local public organisations and corporate bodies with a propensity for cooperation (for instance, universities or research institutes);
- international private organisations and corporate bodies (for instance, large international NGOs or family networks);
- national and local private organisations and corporate bodies (for instance, national or local NGOs, research foundations, museums).

A third distinction to be kept in mind is among organisations and corporate bodies with a specific mission to operate in International Cooperation and those that, though their mission is distinct, regularly and systematically operate in the field of International Cooperation. The case of universities is typical: though higher education in their own country is their mission, they have long developed cooperation programmes and strategies for employment in other countries.

Now let's pass to a brief overview of the **professional profiles** that are required by International Organisations. The operatives of Governmental Organisations can be classified according to various criteria, particularly:

- as per the competences and/or duties: executives at a managerial level (bearing political as well as administrative responsibility) and officers; employees in various sectors, including legal, administrative, logistic, media/communication, technical, other auxiliary services such as translation, secretariat; within the United Nations, there are different staff categories: professional and higher categories (P and D); General Service and related categories (G, TC, S, PIA, LT); National Professional Officers (NO); Field Service (FS); Senior Appointments (SG, DSG, USG and ASG); additionally there are thematic categories: Political, Peace and Security; Management and Operations Support; Economic and Social Development; Information Systems and Communication Technology; Legal; Public Information and External Relations; Conference Management; Safety and Security;
- as per the position: operatives working in headquarters or in peripheral field offices (permanent missions in other States or organisations; delegations; local offices, etc.);
- as per the duration: agents with permanent or temporary assignments;
- as per the functional approach: agents with tasks linked to a project or to an event (e.g. international conferences) and agents with tasks linked to permanent functions;
- as per the position in the organisation: agents internal to the structure or external advisors;
- as per the contents of the duties or assignments: agents with ordinary operational functions; subjects with assignments requiring verification / certification / evaluation; subjects retained for periodic consultation on demand (e.g. members of advisory boards).

Among the key characteristics of the relationship between the individual and the organisation we can enumerate: the constitution of a typical juridical tie (we can distinguish among a fiduciary bond for elected political positions and an employment bond for functions developed in a permanent and exclusive way); mandatory independence from the State in which the individual holds citizenship; the severe regime governing prohibitions and conflicts of interest; the rigorous criteria and procedures of nomination; the peculiar regime of rights and duties; the severe regime of political responsibility (for high level positions like secretary and general manager) and administrative responsibility to the organisation; the direct liability of the organisation to third parties and consequently the rigorous right for the organisation of being reimbursed by its guilty officer ; the presence of special jurisdictional bodies (e.g. the Administrative Court of the U.N., of the ILO, of the WBG). How does the recruitment of

personnel by the international organisations work? Even though it's impossible in this chapter to provide a suitably detailed examination, we can mention it briefly.

The organisations use ad hoc internal structures and sometimes even autonomous corporate bodies for the recruitment of their human resources, that form a part of the broader articulations devoted to HR management; additionally, they promote the entry of new operatives at multiple levels, with special work programmes that are very important to know and to monitor. The United Nations enumerate the following programs and/or initiatives: Young Professionals Programme; Language Competitive Examinations; Associate Expert Programme; Volunteer Programme; Internship programmes; temporary jobs. The European Union uses a proper recruitment office, denominated EPSO (European Personnel Selection Office). For more information, see the paragraph on Additional/Suggested Materials.

As regards NGOs, the distinctions mentioned above at the structural and functional level are still valid. Differences occur on the plane of relationships with the organisation and the juridical status of the individual working for the organisation: immunities and protections granted to high level agents and officers, as well as special rights, tend to be inferior, especially when it comes to remuneration (though salaries can reach elevated levels in some NGOs); obligations are less severe, particularly with regards to conflicts of interest and independence from one's State of nationality. Even selection procedures tend to be less complex and formal, though they are not necessarily any less demanding.

## 2. To point out to students concrete pathways to be undertaken (counselling)

On this point a premise is necessary. Every individual career, to develop effectively, must respect three stages: motivation, formation, exercise of profession. In the first two, students educate themselves in their profession, motivating and adequately preparing themselves; in the third they concretely organise the exercise of their profession. A closer examination would be opportune but it is not possible in the present chapter; nevertheless, some qualifications are necessary.

Regarding **motivation**, it's a process of evidently progressive construction. First of all it is important for students to know and to understand determined realities, particularly that of the so-called developing countries. From the knowledge of these realities desire for a hands-on experience arises. The purposes can be the most disparate: curiosity, apprenticeship, a search for economic gratification or new friendships, an expression of humanitarian values, or even a simple need for employment, in certain cases. The identification of the real motivations for an experience will influence its various aspects: place, duration, content, level of commitment, relationships and contacts established will be different. By elucidating the underlying purpose, a teacher can incisively aid in the focusing of students' motivations by managing the following initiatives: the students' acquisition of direct and personal

knowledge of the local reality (with conscientious tourism, with a degree thesis, with formative stages or with the so-called summer group experiences that a lot of NGOs promote with youngsters; in-depth study of the social, economic, and political realities of developing countries (courses, seminars, cultural events, cinema projections, texts, websites, etcetera); in-depth study of the world of International Cooperation (lectures, conferences, membership in associations and movements).

Once a suitable level of motivation and awareness has been reached, it's possible to move on to the preparation stage. It includes two components: theoretical and practical; both in a technical-professional profile and in a cultural profile. Particular importance must be given to the elements that characterize developing countries (geography, languages, anthropology, history, etcetera). In this phase the teacher can incisively help the student to define both for theoretical and for that practical training the following aspects: level, contents, place, context, and environment, possible tutors and partners.

At that point, the student will be ready, or at least less unprepared, to face the concrete exercise of their profession. On this subject, let's recall what we already underlined above about the typologies of performing professional activities: long-term international volunteering, professionalism and demi-professionalism. Additionally, it's important to emphasize that the student, however well motivated and prepared, need not practice a profession in whatever field typically corresponds to their educational degrees (for instance an accredited engineer working in engineering). In fact, there are many fields in which the acquired knowledge and experiences can be reemployed and sometimes "re-invented". As examples, the following job options can be cited: working in governmental Development Cooperation administrations (foreign affairs ministries, cooperation ministries, national cooperation agencies; other ministries, e.g. environment, agriculture, economic development, etc.); working with the local authorities (Decentralized Cooperation); working in the European Union or in other regional organisations (es. OAU, OAS, ASEAN etc.; both in the central apparatus and in the peripheral delegations and representations); working in the Agencies of the United Nations; working in other multilateral organisms (WB, IMF, OECD, OSCE etc.); working in the International Coalitions; working in transnational NGOs; working in national and local NGOs; working in emergency and humanitarian organizations; working as a journalist for development; working in Cooperation through the Web; working in movements and in informal international networks; working in Fair Trade; working in Ethical Finance and Microfinance; working in education for sustainable development (there are four general areas: school environments, adults education, intercultural education, lobby/advocacy); working in the world of vocational training, professional training or higher education; working in scientific research applied to developing countries; working in the world of cooperative enterprises; working in commercial or industrial transnational companies committed to sustainable development and corporate social responsibility; working freelance for Development Cooperation (e.g. advisors for Governmental

Organisations or NGOs, for companies, for local counterparts in developing countries, for Fair Trade groups or cooperatives, etc.).

In this framework, the teacher's active role consists of conceptualizing together with students a pathway able to effectively embrace all three stages. To get started it can be useful, for example, to monitor – for students or even better with them – solicitations for proposals and offers, events and initiatives, for instance any training opportunities, residential or online (e.g. those offered by UNITAR, the United Nations Institute for Training and Research). It's highly profitable to cultivate constant contacts with offices or individual officers of various organisations in order to receive up-to-date news, obtain suggestions, and identify the best modalities or situations for students. On that topic, see the Bibliography and the section on Additional/Suggested Materials. To build or facilitate students' careers, it can be very effective to accompany them as they prepare for selection processes: for instance, by having them take practice versions of vocational tests or interview questions, which organisations often make available for candidates (e.g. for the UN, samples of written tests are available on the internet: the General Paper, which is the same for all job categories and tests applicants' drafting abilities and/or their knowledge of international affairs; the Specialized Paper, which tests applicants' analytical thinking and their substantive knowledge corresponding to the job category they are taking the exam for).

### 3. To motivate the students to undertake these runs (coaching)

We already underlined the importance of transmitting to students the awareness that a well structured professional pathway cannot disregard a construction of clear and solid individual motivations; in fact it constitutes the first stage of the process. But the teacher's role can and should also be to actively promote such motivations: to look for and to cultivate the individual motivations of each student, i.e. the whole complex of ideas, ideals, convictions, desires, aspirations, gratifications, talents, natural propensities, ambitions, and projects that direct and sustain the student in his/her path, in a both daily and long-term perspective. The best tools are interpersonal talk and dialogue, for which obviously the teacher must also develop an ability of to listen to and be available for students.

### 4. To accompany the students that have undertaken the course (mentoring)

This fourth aspect of the teacher's role is perhaps the most arduous and often fatiguing, but is also decisive for attaining good result in International Cooperation experiences, as well as being the function that most valorises the figure of the teacher. The concept of accompaniment must be clarified: it does not mean physically going with the student to the places where he/she is assigned to carry out his/her experience, but rather constantly

supporting him/her, offering help under various profiles: bureaucratic (search for and completion of selection processes); logistic (organisation of travel, food, lodging); psychological (support in moments of personal difficulty, in situations of tension with other colleagues or counterparts, etc.); operational (advice for technical aspects of the student's assignments, discussion of the results, etc.); evaluational (valorisation of the experience, realising a follow-up, etc.). Of course, because it is an auxiliary support, it should never substitute the efforts and responsibilities of the student.

#### 5. To mediate the demands of the student candidates and the corporate bodies/organisations promoting the experiences or expected to host the students (matching)

The teacher can play a decisive role not only in making possible the meeting between student and organisation but also in making it work in the best way, combining the formative, personal, and professional demands of the former with the institutional, structural, and operational demands of the latter. Probably not all readers will agree on this fifth aspect, believing that, on the contrary, a teacher should not assume too many responsibilities. In the author's opinion, if teachers want their students to have a suitable and effective educational pathway, then they must undertake a proactive accompaniment as the students try to match their demands with available offers.

In conclusion, the teacher's role can be highly articulated and variably intense according to the situation (and obviously varying from teacher to teacher). Furthermore, all depends on the teacher's **conviction, commitment, and capability**.

In this regard, there are plenty of suggestions to be made, but we will limit ourselves to just a few ideas. The challenge teachers face plays out on two axes: formative and operational. As for the first, it must be said that the teacher should plan a precise **formative pathway**, oriented to these goals: to acquire awareness of their role, to strengthen convictions and motivations for their role, to acquire capability for their role.

Once the first is completed (even though he/she never finishes learning and maturing), an **operational pathway** can be faced, in which the teacher actively practises their role. On that topic, the following suggestions surely seem recommendable: gradualness; experimentation with controllable risks; creation of a stable network of subjects and external points of support; attention to orient experiences towards the enrichment of his/her own didactic work, maintaining as many connections as possible between the promoted experiences and his/her own specific matter of study.



## CONCLUSIONS

To conclude this chapter, we can summarize as follows the **achievements** that can be attained through a personal commitment by teachers to promoting and supporting students' experiences as above described:

- helping all students understand the global system of development cooperation, its actors and the opportunities they offer in terms of jobs and careers, and enhancing their motivations (improving the **individual care for students**);
- improving the theoretical and practical curriculum offered by their university, in terms of: education for future professions (motivations, capabilities acquired); opportunities (careers, jobs, information or recruitment channels, etc.); network of contacts (individuals and entities; specific contact persons, offices, phone number/email address/other contacts, etc.) (improving the **didactic offering**);
- enhancing the capacity of your university to guarantee its students concrete long-term results in terms of jobs (improving the **university's placement capacity**).

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## ADDITIONAL/SUGGESTED MATERIAL

### PowerPoint Presentations:

- International Humanitarian Careers: a Career in the United Nations or with System Organizations and working in NGO's. Available at:  
<http://navigator.wlu.ca/content/documents/Link/career%20new%20website/intljobsearch/International%20Humanitarian%20Careers%20presentation%20Fall%202009.pdf>
- What has become of them? Survey about former junior assistants. Available at:  
[http://issuu.com/belgiandevelopmentagency/docs/what\\_has\\_become\\_of\\_them\\_survey\\_about\\_the\\_former\\_ju?e=1900019/2570499](http://issuu.com/belgiandevelopmentagency/docs/what_has_become_of_them_survey_about_the_former_ju?e=1900019/2570499)

### PDF materials:

- UN Sample Examination, General Paper. Available at:  
<https://careers.un.org/lbw/home.aspx?%20viewtype=N>
- What do you want from a career?, available at  
[http://europa.eu/epso/doc/brochure\\_what\\_do\\_you\\_want\\_from\\_an\\_eu\\_career\\_en.pdf](http://europa.eu/epso/doc/brochure_what_do_you_want_from_an_eu_career_en.pdf)
- Europe's challenges, your opportunities, EU, available at  
[http://europa.eu/epso/doc/eu\\_careers\\_brochure.pdf](http://europa.eu/epso/doc/eu_careers_brochure.pdf)
- EU Careers – The selection procedure, EU, available at  
[http://europa.eu/epso/doc/selection\\_procedure\\_en.pdf](http://europa.eu/epso/doc/selection_procedure_en.pdf)
- Getting started with your career planning, available at  
[http://careerweb.leeds.ac.uk/download/downloads/id/117/getting\\_started\\_with\\_your\\_career\\_planning\\_pdf\\_version](http://careerweb.leeds.ac.uk/download/downloads/id/117/getting_started_with_your_career_planning_pdf_version).
- Career Resources for Biological Sciences Students, available at  
[http://www.chemistrystudents.leeds.ac.uk/fileadmin/user\\_upload/Chemistry/Career\\_resources\\_for\\_Biology\\_VI\\_1\\_.pdf](http://www.chemistrystudents.leeds.ac.uk/fileadmin/user_upload/Chemistry/Career_resources_for_Biology_VI_1_.pdf)

### Websites:

Career description (here you can find a directory of websites, by way of illustration):

- <https://careers.un.org>
- <https://inspira.un.org>
- [www.unvolunteers.org](http://www.unvolunteers.org)
- [http://www.undesa.it/human\\_resources/links\\_jpo.htm](http://www.undesa.it/human_resources/links_jpo.htm)

- [www.ilo.org/global/about-the-ilo/employment-opportunities/lang--zh/index.htm](http://www.ilo.org/global/about-the-ilo/employment-opportunities/lang--zh/index.htm)
- <http://www.ifad.org/job>
- <http://web.worldbank.org/WBSITE/EXTERNAL/EXTJOBSNEW/0,,contentMDK:23122244~menuPK:8680050~pagePK:8454306~piPK:7345678~theSitePK:8453353,00.html>
- [www.wto.org/english/thewto\\_e/va-can\\_e/recruit\\_e.htm](http://www.wto.org/english/thewto_e/va-can_e/recruit_e.htm)
- [www.oecd.org/careers](http://www.oecd.org/careers)
- [www.osce.org/employment](http://www.osce.org/employment)
- [http://europa.eu/epso/apply/in-fo\\_sessions/index\\_en.htm](http://europa.eu/epso/apply/in-fo_sessions/index_en.htm)

**Job vacancy research** (here you can find a directory of websites, by way of illustration):

- <http://unjobs.org/themes/international-cooperation>
- <http://jobs.undp.org/index.cfm>
- <https://erecruit.ilo.org/pub-lic/>
- <http://reliefweb.int/jobs>
- [www.ccic.ca/resources/jobs\\_e.php](http://www.ccic.ca/resources/jobs_e.php)
- [www.eadi.org/devcareers.html](http://www.eadi.org/devcareers.html)
- [www.eu-robrussels.com/jobs/external\\_relations\\_and\\_development\\_aid](http://www.eu-robrussels.com/jobs/external_relations_and_development_aid)
- [www.weitzenegger.de/content/?page\\_id=1971](http://www.weitzenegger.de/content/?page_id=1971)

#### **Videos:**

- [www.unitar.org/media/unitar\\_news](http://www.unitar.org/media/unitar_news)
- <http://cooperation.courtdujour.ch/> (see menu: dozens of video interviews about international cooperation; subtitles in 4 languages)
- [http://www.youtube.com/watch?feature=player\\_embedded&v=zRgzpnFE\\_R4](http://www.youtube.com/watch?feature=player_embedded&v=zRgzpnFE_R4) (USAID)

#### **E- Courses:**

UNITAR (UN Institute for Training and Research) online catalogue, available at [www.unitar.org/event](http://www.unitar.org/event).



PHOTO: Volunteering in Sierra Leone.  
Santiago Baena Velasco

# 3

## CHAPTER

# Action and research preparation and following up

**B.4**

Supervising engineering students

# 3

## CHAPTER 3. Action and research preparation and following up

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# 3

## ACTION AND RESEARCH PREPARATION AND FOLLOWING UP

**José Ramón Cobo** and **Manuel Sierra Castañer**, professors at the Universidad Politécnica de Madrid

### EXECUTIVE SUMMARY

This chapter tries to establish the key aspects in the supervision of a BSc or MSc Thesis, including aspects such as: the relationship with the development project where it is included; the goals, expected results, action preparation and following up; and the writing of the Thesis.

The chapter is divided in the following sections:

- Origin of the project: relationship with the development project, role of the student and supervisor, communication with those responsible for the development project; required memorandums of understanding, study and analysis of the development project.
- Preparation of the work: planning and timetable, budget, expected results.
- Following up: role of the academic supervisor, role of the student, role of those responsible for the development project.
- Writing of the Thesis and dissemination of the results.

## LEARNING OUTCOMES

After you actively engage in the learning experiences in this module, you should be able to:

- Know which aspects are fundamental to include in an International cooperation thesis.
- Teach students how to clearly define the objectives.
- Know how to develop a timetable.

## KEY CONCEPTS

These concepts will help you better understand the content in this session:

- Broad literature review (technical, cultural, social and economic aspects).
- Defining objectives and methods.
- Timetabling and project programming.

## GUIDING QUESTIONS

Develop your answers to the following guiding questions while completing the readings and working through the session:

- What is the interaction between the academic supervision and the professional supervisor (person responsible for the development project)?
- Which are the specific topics to be covered in this kind of Thesis?
- What is the role of this academic project in a cooperation for development action?



## INTRODUCTION

In recent years, there has been an increase in development projects being undertaken as Masters or Final year undergraduate projects in Technical Studies subjects throughout European Universities. This is due to closer relationships developing between Technical Universities and NGO partners as a result of universities participating in Cooperation for Development as another actor of the EuropeAID system.

Universities can work in several areas of International Cooperation for Development, for example: education on development; research projects; evaluation of actions and policies; empowerment of actors, in particular universities; education of personnel from NGOs, agencies and companies; transfer of knowledge, advising and consulting.

For some of those ways of engaging, it is recommended to work in networks including multiple actors, where each one is able to contribute their experience and knowledge to the benefit of the overall project. In these cases, some of the work can be done outside of the curriculum in collaboration with professors, researchers and/or students and, in others the Master's Thesis is an appropriate tool for guiding the work of the student.

Either way, it is important to firmly establish the roles of the different actors and the relationships between them and the academic supervisor and student should know the main aspects of the project where they are going to collaborate. This section tries to establish these aspects in a general way but of course, each particular project will have their specific particularities, and some of the rules expressed here should be updated for each situation.

## PREVIOUS STEPS TO THE BEGINNING OF THE PROJECT

Before beginning the Thesis itself, it is necessary to have a good knowledge of the project and a clear framework outlining the relationship among the actors. In this sense, the following aspects are considered to be important – the comprehension of the development context and the matching of the thesis to it, the roles of the different actors involved, and the required aspects to include in a Memorandum of Understanding.

### 1. Study and analysis of the development project and the context.

Usually, the Master's or Bachelor's thesis is integrated as a part of a wider development project, and very often within a wider programme headed by another actor: usually an NGO. In this case, the following have been identified as important aspects for a successful student project:

- Understanding the NGO's mission and vision: it is important to understand, agree and align with the strategic objectives of the NGO. A project is not a single component, but very often a step in longer term action. In that sense, not only is the technical knowledge of the participants important, but also the attitudes and values.
- Knowledge of the programme: the objectives and expected results of the wider programme where the cooperation project is included should be known to understand the objectives of the project. It has to be recognised that the thesis is a small part of bigger initiative, but that it is still important to achieve the expected results.
- Knowledge of the cooperation project: in the same sense, the objectives, activities and results of the cooperation project need to be known and understood. In particular, the role of the thesis in the project has to be understood from the beginning, and how it interacts with other activities.
- Understanding the context: the social and cultural context of the area and country should be studied. One of the main problems is the integration in a different cultural environment.
- Knowledge of the roles of the different participants in the project: in a cooperation project there are workers from the NGO in the main office (in a developed country), volunteers, expats (in the developing countries), partners in the field, financiers, local governments, beneficiaries, and other stakeholders.
- Definition of the objectives of the thesis and planning: this will be explained in next section.

## 2. Role of the different actors

Even if there are many actors in, as highlighted in the previous section, the key ones are: student, academic supervisor and professional supervisor.

- **Role of the academic supervisor:** the academic supervisor is responsible for the technical education of the student. They have to assure the work developed by the student is of sufficient quality to be presented as an academic work, and fulfill the criteria of their Higher Education Institution. They also have to assure that the work of the student has the appropriate quality for the development project.
- **Role of the professional supervisor:** the professional supervisor is responsible for the student during any stay in the field. They have to guide the student, assure a good relationship with other members of their team, detect deviation from the objectives of the project and foresee problems, and

collaborate during the preparation of field work in particular regarding the logistical aspects.

- **Role of the student:** the student has to act in a professional way. The project can be seen as the last period of their education of the student but also as their first professional experience. They are responsible for working in a professional way during the project and any fieldwork and understanding and agreeing with the values of the NGO. The student is also responsible for finishing all the steps related to completing the thesis: preparation of the work, the delivery of the work itself, and the writing and defence of the thesis. The student has to interact with both the academic and professional supervisors, and harness the skills of both to complete a good thesis that is useful for the development project.

### 3. Memorandum of Understanding

The previous information regarding roles and responsibilities should be included in a Memorandum of Understanding as well as the following information. In fact, two agreements can be signed: a first one general for the collaboration and a second one specific for each student. The first one should include:

- **Signatures of the Memorandum:** depending of the institutions, the MoU should be signed for the recognised person.
- **Reasons of the collaboration:** emphasising the goals of each institution in the cooperation for development field.
- **Aspects of the collaboration:** defining the number of students, the duration of the stays, programs, profile of the students.
- **Supervision team of the agreement:** typically the person responsible for the programme in the NGO and the person responsible for the cooperation at the university. Their role is to assure the continuity of the action and the solution of possible misunderstandings.
- **Management of the collaboration:** including aspects regarding the selection process of the students (usually among both institutions), the initial education/training in the origin country (usually a period in the central offices of the NGO and/or the University), the type of relationship of the student with the NGO (typically through an internship or volunteering, and rarely through a work contract).
- **Financing of the student:** the MOU should outline who will pay for the travel expenses (from Europe to the country), the accomodation, the insurance (travel and civil responsibility/public idemnity), the per diem (daily expenses), internal travel, and vaccinations. Depending of the roles of the students (practitioners, volunteers, etc) there are different national legislations that should be checked. Usually, a compromise between the three parties is the best solution.

- **Responsibilities of the parties:** including the responsibilities of the NGO (professional supervision, logistic, selection, etc), University (selection, academic supervision) and student (professional work during the project and respect to the values of the NGO).
- **Intellectual Property Rights:** the rights of each party should be established, according to agreed legislation. Usually the property of the work done in the field belongs to the NGO, the intellectual property to the student, and the thesis to the University; but ultimately that the research findings are publically available.
- **Duration and Termination of the agreement:** a typical period of time for the MOU is around 5 years, with a termination clause allowing any one or more of the parties to terminate the agreement. **Resolution of controversies:** define the court of law where it is agreed issues will be resolved if there is not the possibility of a friendly solution.

The second document, usually signed by the supervision team and the student themselves, is the **specific work program** for the student, including:

- **Name of student, academic supervisor and professional supervisor.**
- **Logistical details:** duration of the stay, working place, housing (if required).
- **Specific rules** during the stay, if necessary.
- **Objective, activities, expected results** and planning for the Thesis.

Finally, the objective of these documents is to establish a kind of contract among the three parties in order to solve any foreseen possible controversies. Obviously, it is impossible to consider every aspect and a mutual comprehension and a positive attitude is needed.

## PREPARATION OF THE WORK: PLANNING AND TIMETABLE, BUDGET, EXPECTED RESULTS

A successful Bachelor's /Master's Thesis is the individual work of a student, advised by one or more tutors, where the proposed solution is able to meet a real need with enough complexity to exhibit the application of the student's acquired knowledge and training from their studies. Consequently, the Bachelor's/Master's Thesis must satisfy two kinds of requirements:

- An academic one, for the purpose of sufficiently exhibiting the acquired knowledge of the student.
- A professional one, which tries to solve a set of interrelated and complex problems and choose a realistic solution that is not only technical but also in terms of time, cost and sustainability.

The first step to ensure the quality of a Bachelor's/Master's Thesis is the development of the project scope. In this sense, once the project stakeholders are known, it is important to define the project objective/s. The project objective is defined as the operational purpose of the project, that is, goods and services resulting from the project implementation that address a specific problem and contributing, in the end, to improve the living conditions of the beneficiaries. The following table lists some considerations for defining the project objectives.

**Table 1** Recommendations for defining objectives

| RECOMMENDATION                     | DESCRIPTION  |
|------------------------------------|--|
| Clear and well-defined objectives  | Avoid several objectives in a statement  |
| Clear, accurate and not generalist | Revealing clearly the purpose to be achieved. Identify what you really want to contribute to |
| Avoid mixing means and goals       | Clearly define the purpose avoiding explanation of how you plan to get there                 |
| Realistic                          | In relation to the capabilities and resources available                                      |

After defining the objectives, it is important to define project deliverables (or expected results): those results should be measurable, tangible and verifiable and are required to complete a project phase or the entire project. The following table lists some considerations for defining the project deliverables.

**Table 2.** Recommendations for defining deliverables or expected results

| RECOMMENDATION         | DESCRIPTION   |
|------------------------|---|
| Consistent             | With the above objectives set                           |
| Relevant and pertinent | In order to meet the objectives                         |
| Direct and tangible    | Result of the activities carried out                    |
| Realistic              | In relation to the capabilities and resources available |

It is in this planning and scoping phase where it the factors influencing the implementation of a development project should be considered:

- Policy support: consistency with national and local policies of the project environment.
- Appropriate technology: capacity of local organisations to maintain the technology and knowledge transferred once the project is completed.
- Environment: assessment of the environmental effects of the project implementation.

- Socio-cultural aspects: assessment of the socio-cultural transformations that may occur, to ensure they are appropriate in that context.
- Institutional capacity management: ensuring the capacity of local partners to take over the technical and economic self-management of the project after completion.

The quality, relevance and usefulness of a development project will be determined by consideration of these factors as well as the consideration of sustainability so that project results will continue in the future. The following figure shows the different steps involved when planning a development project.

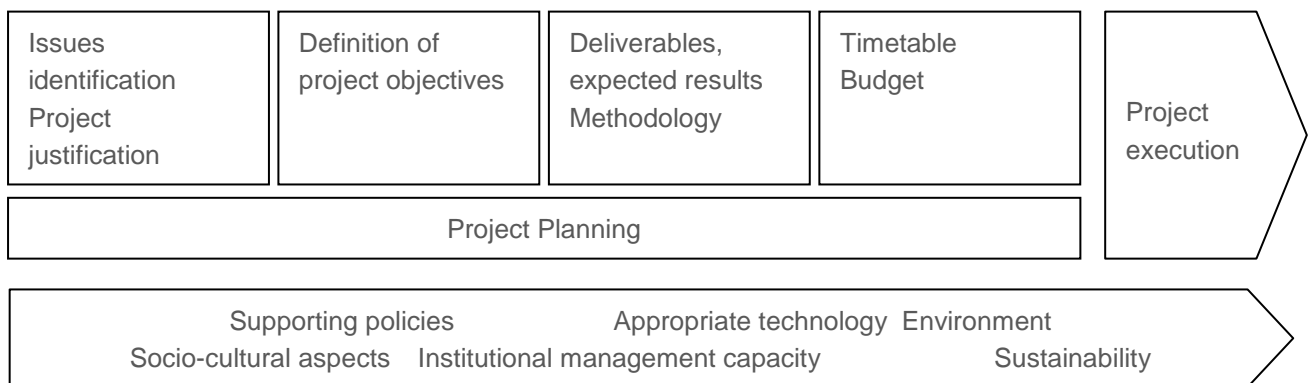


Figure 1 Project development outline

Once planned, the work should be performed with consideration of the above highlighted issues and the most appropriate methodology to get the necessary information. Some of the most representative methodologies used in the field of development (reference) include: literature review, direct observation, case studies, action research, the Delphi method, surveys, statistical analysis and semi-structured interviews.

At this stage of project development it is recommended to prepare a diagram linking the phase of the project, the methodology used in each stage and the expected results to meet the deliverables as defined above. This diagram will ensure consistency and relevance of the project in progress. The following figure shows an example of the structure of this type of diagram.

| Phase                                 | Method                  | Participants  | Deliverables/Expected results   |
|---------------------------------------|-------------------------|---|---|
| 1<br>Model Design                     | Literature review       | Researcher  | Available technologies for context  |
|                                       | Case studies            | Program Manager<br>Project Manager  | Characterization of organizations<br>Assurance of institutions engagement |
|                                       | Interviews with experts | Beneficiaries<br>Local institutions                                       | ...   |
| 2<br>Development and model validation | Technology development  | Researchers of university partner<br>Representatives of local institutios | Model especifications<br>Implementation alternatives                      |
|                                       | Validation and testing  | Action research<br>Beneficiaries  | Maintenance manual<br>Technology validated and in operation               |

Figure 2 Sample chart linking methodology, participants and expected results

After completion of the project planning, it is time to perform the project schedule to define what activities are necessary for the achievement of pre-defined deliverables. Having identified the different activities, it is recommended to estimate the duration and dependency links between them. This will provide an estimate of intermediate delivery dates for adequate monitoring of project progression. The development of this detailed timetable will help identify potential deviations from the initial project planning so that work can be reorganised should this happen and minimize the occurrence of unexpected events.

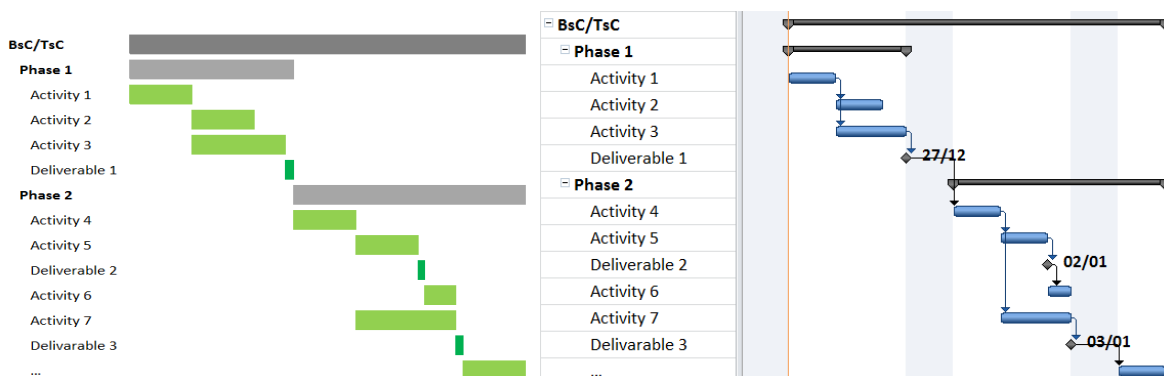


Figure 3 Timetable examples to organise the activities and deliverables.

The previous definition of objectives, deliverables and activities allows us to perform an economic assessment of the project being carried out: the budget. The most common items to consider in implementing the budget of a project are:

- Inventorial material. Basic technical equipment to carry out the project or research: i.e. computers and printers. All those items that can be catalogued and inventoried.
- Consumables (also known as consumable goods, nondurable goods, or soft goods) are goods that are capable of being consumed, that may be destroyed, dissipated, wasted, or spent.
- Staff expenses. Concerning human resources participating in the project.
- Travel expenses: including room and board.
- Other expenses: publications, dissemination of results.

Table 3 Budget structure example

| CONCEPT                     | UNITS | COST/UD. |                                 |
|-----------------------------|-------|----------|---------------------------------|
| <b>Inventorial material</b> |       |          | Subtotal inventorial chapter    |
| - ...                       |       |          |                                 |
| - ...                       |       |          |                                 |
| <b>Consumables</b>          |       |          | Subtotal consumables chapter    |
| - ...                       |       |          |                                 |
| - ...                       |       |          |                                 |
| <b>Staff expenses</b>       |       |          | Subtotal staff chapter          |
| - ...                       |       |          |                                 |
| - ...                       |       |          |                                 |
| <b>Travel expenses</b>      |       |          | Subtotal travel chapter         |
| - ...                       |       |          |                                 |
| - ...                       |       |          |                                 |
| <b>Other expenses</b>       |       |          | Subtotal other expenses chapter |
| - ...                       |       |          |                                 |
| - ...                       |       |          |                                 |
| <b>TOTAL BUDGET</b>         |       |          |                                 |



Next begins the execution phase of the project to achieve the expected results from the activities defined.

### Writing of the Thesis and dissemination of the results

The proper wording of the Bachelor's / Master's Thesis is a crucial aspect as it represents the formalisation and documentary record of the proposed solution. A valid suggestion in many cases is to divide the project into a concise report, formal writing and discourse, and a set of appendices that cover the explanations, calculations, tables, programs, data collection etc.

Thus, the report will cover the general features with the most important results and conclusions, with constant references to the annexes which contain detailed information demonstrating the accuracy of the approaches, the complete calculations etc.

In the general structure of a Bachelor's / Master's Thesis it is recommended that it includes at least the following contents:

- Executive summary.
- Index / Contents.
- Context and justification.
- Objectives.
- Methodology.
- Development and practical application.
- Results and discussion.
- Conclusions.
- Bibliography.
- Time planning and budget.

With regard to writing style, here are some recommendations:

- The writing style must be impersonal and objective.
- The title of the Bachelor's / Master's Thesis must be clear, precise, direct and complete.
- The name of a chapter or subchapter will be short and relevant, so that it clearly indicates the content contained within.
- Paragraphs will preferably be short, trying to express an idea for each of them.
- It is necessary to avoid repetition in the same sentence or use informal/conversational language.

- The technical language should minimise the use of adjectives and adverbs as their use tends to go against objectivity.
- Do not overindulge in conjunctions if the text is understood without them.

Regarding the document format, the following recommendations are also presented:

- Font size and type. The recommended font size for the Bachelor's / Master's Thesis is 12 points. It will be 11 points for figures and tables captions, and 10 points for foot notes. The font types most used and recommended are Times New Roman and Arial.
- Paragraph, line spacing and line justification. The line spacing is normally in the range of 1 (single) to 1.3. It is advisable to justify the text of the document and to leave a line between paragraphs.
- Recommendations about references: the previous work should be referred using the standard style recommendations (Author, Date, Date, Editor).

Once the report element is written and delivered the an accompanying presentation is often necessary to present the results in an orderly way, highlighting the most accurate and representative conclusions.

The recommended structure for the presentation is as follows: cover, index, context, objectives, justification, methodology, practical application, results and conclusions.

The most common criteria to be considered for the final evaluation of this presentation are usually:

- Quality of work: content, relevance, information sources, document formality, complexity, applicability, sustainability.
- Presentation: quality and clarity of slides, and communication skills of the candidate.

## CONCLUSIONS

This chapter has established some ideas for the preparation and following up of the work of the student undertaking a Bachelor's or Master's Thesis. These ideas include the signature of an Agreement or Memorandum of Understanding where all the important aspects are established and agreed upon and the role of each one of the actors: student, professional supervisor and academic supervisor are appointed. Recommendations about the planning and timetable, budget and expected results have also been made. Finally, it is important to complete the work with a high quality report and presentation, in order to be able to properly disseminate the results.

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# 4

## CHAPTER

# Field work preparation and following up

PHOTO: Final Thesis: Undertaking a study of agroforestry in a mountain basin, Claveria, northern Mindanao Island, Philippines. Miguel López Delgado

# 4

## CHAPTER 4. Field work preparation and following up

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# 4

# FIELD WORK PREPARATION AND FOLLOWING UP

**Rachel Smith**, Engineers Without Borders UK

## EXECUTIVE SUMMARY

This session is not intended to be a substitute for alternative health and safety frameworks, such as those required by the participant's university. Rather, it seeks to give an overview of pre-departure knowledge which would be important for the academic to consider passing on to their student. Participants are encouraged to continue to research the requirements for travel of their university and other relevant institutions.

For field work to be carried out effectively, safely and efficiently, proper prior planning is required by both the supervising academic and the student. Planning should not only focus on the academic requirements of the student's time in the field, but also on a broader spectrum of factors including the student's personal needs, appropriate organisational tools for before, during and after their travel, as well as health and safety considerations and practical arrangements relative to the local context where the student will be travelling to. This session explores preparatory measures and tools for both the academic and the student to ensure that time in the field is spent effectively and safely.

## LEARNING OUTCOMES

After you actively engage in the learning experiences in this module, you should be able to:

- Recognise and define factors influencing risk in field work.
- Guide students to develop and utilise tools such as checklists, risk assessments and calendarisation for effective preparation and follow-up of field work.
- Design and establish plans for collecting and storing field work data.

## KEY CONCEPTS

These concepts will help you better understand the content in this session:

- Risk assessments as preparatory and in-field decision making tools
- Calendarisation and checklists
- Health and safety considerations for travelling and working abroad
- Data collection and management

## GUIDING QUESTIONS

Develop your answers to the following guiding questions while completing the readings and working through the session:

- What affects perception of risk for different people?
- How can my students utilise organisational tools to aid my preparation and time in the field?
- What is the safest and most effective way(s) for my student to collect and store the type of data required?

## INTRODUCTION

For field work to be carried out effectively, safely and efficiently, proper prior planning is required by both the supervising academic and the student. Planning should be holistic and consider needs and requirements outside the immediate academic considerations of the student's field investigations and analysis. The following areas should be considered: (1) Organisational; (2) Academic; (3) Personal; (4) Health and safety; and (5) Practical.

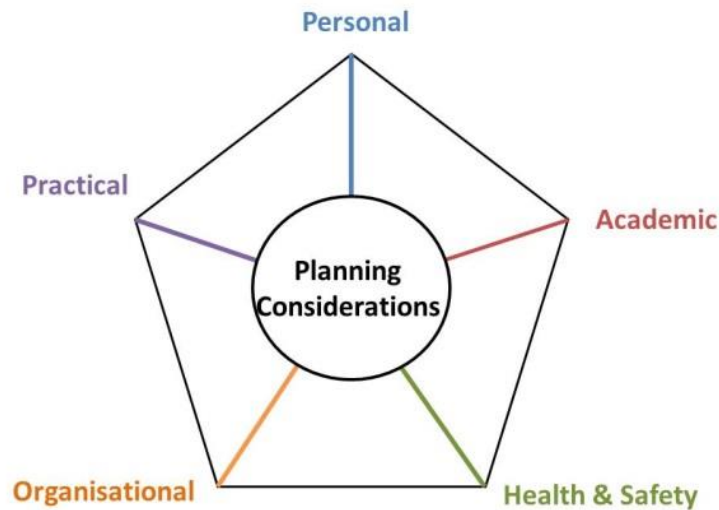


Figure 1 Different considerations for pre-departure planning

Considering these five areas, organisational tools can help ensure that the other aspects are covered during the student's preparations.

## ORGANISATIONAL CONSIDERATIONS

One of the first activities to be undertaken with the student should be the creation of a calendar of key dates in the time running up to the field work, with specific activities or actions points and who the responsible person to carry these out is. Calendarising key dates and activities allows the student to plan ahead and ensure that key activities such as travel paperwork and health and safety considerations are all taken into account. Table 1 below gives an example of a calendar. Calendars may be more or less detailed than this example, with adjustments being made as the student progresses through the activities.



Table 1 Example of calendar of key dates and activities in field work preparation and implementation

| Month     | Date             | Activity   | Category                  | Person responsible  | Notes   |
|-----------|------------------|--|---------------------------|---------------------|---|
| February  | 10 <sup>th</sup> | Initial research meeting   | Academic                  | Student & Professor | Discuss calendar, risk assessment and research - prepare these for presentation on 15 <sup>th</sup> Feb |
|           | 15 <sup>th</sup> | Present research plan, risk assessment and calendar for approval | Academic, Health & Safety | Student             | Consider all aspects  |
|           | 18 <sup>th</sup> | Review research plan, risk assessment and calendar               | Academic, Health & Safety | Professor           | Prepare in line with university health & safety and field investigation guidelines                      |
|           | 19 <sup>th</sup> | Adjust research plan, risk assessment and calendar               | Academic, Health & Safety | Student             | Student to incorporate comments from review   |
| March     | 2 <sup>nd</sup>  | Vaccinations and travel health                                   | Health & Safety           | Student             | Vaccinations and any other travel or normal medication  |
|           | 21 <sup>st</sup> | Vaccinations   | Health & Safety           | Student             | Second round vaccinations   |
|           | 27 <sup>th</sup> | Visa application   | Personal                  | Student             | In person   |
| April     | 1 <sup>st</sup>  | Purchase plane ticket and insurance                              | Personal, Health & Safety | Student             | Ensure insurance covers the activities to be undertaken   |
|           | 3 <sup>rd</sup>  | Make arrangements with field partner                             | Practical                 | Student             | Arrangements for arrival, accommodation, field work and departure                                       |
|           | 15 <sup>th</sup> | Field equipment training   | Practical                 | Professor           | Student to be trained in use of key equipment   |
| May       | 2 <sup>nd</sup>  | Undertake first aid training and prepare first aid kit           | Health & Safety           | Student             | Training should be relevant to the region student is travelling to                                      |
|           | 5 <sup>th</sup>  | Field equipment preparation and packing                          | Practical                 | Professor & Student | Printing papers and pack equipment required   |
|           | 22 <sup>nd</sup> | Confirm arrangements with field partner                          | Practical                 | Student             | Arrangements for arrival, accommodation, field work and departure                                       |
|           | 30 <sup>th</sup> | Final checks & packing   | Practical                 | Student             | Ensure copies of travel documents are made  |
| June      | 2 <sup>nd</sup>  | Fly to field destination   | Personal                  | Student             | Contact home on arrival   |
|           | 4 <sup>th</sup>  | Begin field research   | Academic                  | Student             |   |
| July      | 1 <sup>st</sup>  | Interim review meeting   | Academic                  | Student & Professor | Review work to date and adjust plans  |
|           | 25 <sup>th</sup> | Final day of data collection                                     | Academic                  | Student             | Collate all data & confirm departure plans  |
| August    | 1 <sup>st</sup>  | Return flight  | Personal                  | Student             | Contact home on arrival   |
|           | 5 <sup>th</sup>  | Review meeting with Tutor  | Academic                  | Student & Professor | Review field work and outline final report and presentation   |
|           | 15 <sup>th</sup> | Present draft report   | Academic                  | Student             | Report for review   |
|           | 16 <sup>th</sup> | Review draft report & give feedback                              | Academic                  | Professor           | Student to incorporate comments   |
|           | 25 <sup>th</sup> | Submit final report  | Academic                  | Student             | Submit for grading  |
| September | 1 <sup>st</sup>  | Investigation presentation                                       | Academic                  | Student             | Final presentation of findings  |

For the organisation of time within the field, Gantt charts may be used. Activities are plotted against dates and planned timeframes are shaded in the first row that corresponds to the activity, with actual progress shaded in a different colour in the second row as the student completes their field work. Free days with no activities can be planned for rest and also to allow time for when activities are not completed in the original time frame - this can be very common in overseas research where the student is not familiar with the local context and where logistical resources may be limited. Table 2 shows an example of a section of a

Gantt chart where planned activities are shaded in light grey, free days are shaded in blue and actual progress is shaded in dark grey.

Table 2 Example of Gantt chart for planning and reviewing field work progress

|                                | Month: June |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|--------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| Activity                       | 02          | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | etc |
| Arrival & site familiarization | ■           | ■  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Survey preparation             |             |    | ■  | ■  | ■  | ■  | ■  |    |    |    |    |    |    |    |    |    |    |    |     |
| Survey testing & adjustments   |             |    |    |    |    |    | ■  | ■  | ■  | ■  | ■  | ■  |    |    |    |    |    |    |     |
| Survey round 1                 |             |    |    |    |    |    |    |    |    |    |    |    | ■  | ■  | ■  | ■  | ■  | ■  | ■   |
| Etc.                           |             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |

|      |                     |                   |           |
|------|---------------------|-------------------|-----------|
| Key: | Original time frame | Actual time frame | Free days |
|------|---------------------|-------------------|-----------|

For longer, more involved, periods of field work (e.g. doctoral studies), a logical framework format may be useful for the student in order to better define the goals and activities of their field work. Table 3 gives an example of how the logical framework can be used to plan research and investigation projects.

Table 3 Example of a logical framework for planning research field work projects

| Project Component   | Indicator   | Means of verification  | Assumptions  |
|---|---|--|--|
| Overall objective<br>(Hypothesis to be proved or disproved /Goal of research) | The factors that describe the extent of the proof or disproof of the hypothesis (outcomes)      | Description of how the indicators are measured (through the outcomes)  | n/a  |
| Specific objective 1<br>(Outcome 1)   | Analysis and interpretation of the tangible results, e.g. % of samples showing a characteristic | Confirmation exercises e.g. statistical verification, comparison with known literature, repeats of testing, use of control group, etc. | External factors that can affect if the objectives are achieved  |
| Expected Results 1<br>(Outputs 1)   | Tangible result of activity, e.g. completed survey forms, analysed results                      | Results are valid or invalid, e.g. survey forms filled out correctly, no contamination of samples tested                               | External factors that can affect if the results are achieved, e.g. weather does not impede access to sites             |
| Specific activity<br>- 1a<br>- 1b   | Inputs and resources needed for each activity, e.g. funds, equipment, human resources           | Proof that the activity was carried out, e.g. sign-up sheet of participants  | Conditions that need to be met before activities can be carried out, e.g. resources are available at the time required |
| Specific objective 2<br>(Outcome 2)   | As above  | As above   | As above   |
| Expected Results 2<br>(Outputs 2)   | As above  | As above   | As above   |
| Specific activity<br>- 2a<br>- 2b etc   | As above  | As above   | As above   |

Checklists are another organisational tool that should be utilized by the student and academic supervisor to ensure that planning aspects are fully covered. The following checklists should be formulated and utilised before and during the field work:

- **Overall pre-departure checklist** – this may be incorporated into the calendar.
- **Documentation masterlist** – to ensure all personal, travel, legal and academic documents have been completed with copies made and stored correctly.
- **Field risk and hazard checklist** – for consideration of a wide range of hazards in the risk assessment exercise. See Health & Safety section below.
- **Packing checklist** – for equipment and personal items to take on field work.
- **Contact list** – of key and emergency contacts.
- **Field checklist** – for items to take on daily field work.

Regular reporting during the field-work will assist the quality of data-collection and allow for any problems to be identified as early as possible. The academic supervisor and student should establish a regular reporting schedule and format, e.g. weekly. The student should also take daily notes of activities, outcomes and problems in order to inform their weekly reports and overall data analysis.

## PERSONAL CONSIDERATIONS

### Verification of travel documents

Passports and IDs should have a minimum of 6 months validity from the time when the trip ends. Students should also note visas from previous trips in the case that these may prevent or cause difficulty for them entering their destination country for field work.

### Visa application(s)

Students should apply for the correct visas depending on their nationality and country where the field work will take place. In some cases a tourist visa may not be sufficient, and the student may require a formal invitation from a local organisation or institution. This information can usually be provided by the local consulate of the destination country.

### Personal and next of kin details

These should be noted in a university approved format and shared with the academic supervisor, student support office for the academic department, the local host institution, the student and the next of kin. Each next of kin should have multiple contact details including daytime and night-time telephone numbers, complete with international and area codes.

### Documentation copies

Hardcopies and electronic copies should be made of all personal, travel, legal and academic documents relating to the student and their field work, and stored with the relevant contacts. The student should have hard copies with them at all times and electronic copies stored online (e.g. in an email) rather than on a device, such that the documents can be accessible even if the device is stolen. A masterlist of these documents should be held by the supervising academic and student, at least.

### Personal medical considerations

These should include existing conditions, medications and previous vaccines. Similarly to next of kin, these should be noted in a university approved format and shared with the academic supervisor, student support office for the academic department, the local host institution, the student and the next of kin.

### Special considerations for in the field

These should include any needs that the student may have such as diet, mobility assistance, sight, hearing etc. These should be communicated to the local partner.

### Pastoral support

As well as organising meetings and reports for academic progress, the academic supervisor should ensure time is scheduled during the field work to address any pastoral issues the student may have, e.g. culture shock, stress. This is especially important for longer periods of field work or when the student is working outside of a group setting.

## ACADEMIC CONSIDERATIONS

Academic aspects of field work preparation are related to the technical and ethical design of the field work and the academic contact the student will have whilst in the field and include:

### Research approval

A review of the student's research question and plan by the relevant technical groups at the university to ensure it meets standards for the academic level and topic the student is studying.

### Ethical board review

If applicable to the student's work, this should be undertaken in line with the university requirements and any other standards of relevant research or ethics bodies. This should include items such as consent forms or procedures, disclaimers, data confidentiality, use of photographs and videos.

### Technical documents

These include hard and/or electronic copies of any relevant technical documents, guidelines, manual, operating instructions that the student may need in the field. Electronic copies may be preferable if space and weight restrictions apply for the student's luggage.

### Local experts

A contact list and pre-departure contact with relevant academics and/or institutions in the field should be arranged and made available to the student in hard and electronic copy.

## HEALTH & SAFETY CONSIDERATIONS

Regarding health and safety during their field work, it is important that the student(s) understands risk, how to manage risk and how to develop and follow a contingency plan. Several key points are listed first, but this section focuses on risk assessment and contingency planning.

### Health & Safety advice from university

As mentioned at the start of this chapter, this session is not intended to be a substitute for alternative health and safety frameworks, including those required by the participant's university. Students should research the requirements for travel of their university and other relevant institutions.

### Health & Safety advice by country

Students should also research health and safety advice given by their home country regarding the country they will be travelling to. If there is not information available from their home country much information can be found on British Foreign and Commonwealth Office or US Center for Disease Control websites.

## Provision of information and of training

The university should ensure, to the best of their knowledge and capability, that they provide the student with all of the information and training that they require to safely and effectively carry out their field work.

## Personal health

Students should ensure that they undertake a pre-departure medical and dental check-up, covering medications and allergies, vaccine checks and travel medication such as malarial medication.

## First aid kit and training

The student should carry a first aid kit with them in the field. Undertaking first aid training prior to departure should be a consideration, especially if the student will be undertaking work in remote areas.

## Personal Protective Equipment (PPE)

The student should ensure that they travel with and use all PPE necessary to safely carry out their field work. This may include safety boots, hi-visibility clothing, gloves, goggles etc.

## Insurance

Students should ensure that they have suitable insurance coverage for the location(s) they are visiting, the duration of their trip and the type of field work they will be undertaking.

## Risk assessment and mitigation

The level of risk is defined as the product of the likelihood of an event occurring and the consequence of this event occurring:

Risk = likelihood x consequence

Risk varies depending on each person's perception of 'what is risky?'. This also changes with age; as people get older they tend to perceive higher risks. Additionally visitors are usually at higher risk than the local population, as they are not familiar with hazards in the local environment. This means that university aged students visiting a new place could be at high risk.

To properly assess and mitigate risk there are four stages that should be considered:

1. Risk Identification

2. Risk Classification
3. Risk Management
4. Contingency and emergency planning



Figure 2 Stages of risk assessment

1. Risk Identification - Make a list of what could go wrong

- Think about the threats and hazards you may encounter
- Think about what makes you vulnerable to threats and hazards

Here it may be useful to make a Fieldwork Hazard Checklist. For example consider hazards associated with:

- Travelling to the destination.
- Travelling around in the vicinity of fieldwork location.
- The specific activity undertaken.
- Threats to personal security from terrorism, crime, or aggression from members of the public.

- Equipment (manual handling, defects, failures).
- Unsafe accommodation (fire, access from the street, electrical safety).
- Extremes of weather (hypothermia, sunstroke, dehydration, frost bite).
- Location (sea or water courses, landslide, rough terrain, work in trenches, avalanche).
- Contact with hazardous flora and fauna.
- A city environment.
- Locations with low infrastructure and support.
- Ill health (prevalence of disease, foodborne illness, distance from Medical Facilities).
- Inadequate or lack of competent supervision.
- Lone working.
- Fitness or competence of participants on supervised courses.
- Inherently dangerous activities (climbing, diving, caving).
- Inability to communicate or summon assistance.
- Poor or inappropriate student behaviour.
- Failure to develop suitable contingency plans.

## 2. Risk Classification – Which of these should you worry about most?

- Prioritise these risks by consequence and likelihood

To classify risk we can use a risk matrix – see below. This can allow for high level risks to be identified and prioritised for action. Consequences can be categorised as level of injury to persons involved. Likelihood can be difficult to categorise as people often too confident in their ability to carry out tasks without risk because they “have done it a million times”. Likelihood is like a blank slate every day and experience doesn’t necessarily decrease the likelihood of an event occurring. Conversely, experience can increase risk due to complacency and “auto-pilot” with people becoming blind to hazards around them. Confidence of experience can give a false sense of security from risk.



Table 4 Example of Risk Classification Matrix

| Risk Classification Matrix   |                 |   | Likelihood                |  |                                  |                                   |                                      |
|--|-----------------|---|---------------------------|--|----------------------------------|-----------------------------------|--------------------------------------|
| Risk =<br>Likelihood * Consequence   |                 |   | Very Unlikely (1)         | Unlikely (2)                                       | Likely (3)                       | Very Likely (4)                   | Almost certain (5)                   |
| Risk Scores:<br>High Risk: 11 - 25<br>Moderate Risk: 7 - 10<br>Low Risk: 1 - 6 |                 |   | One-off event             | Improbable under the circumstances, not impossible | Possible under the circumstances | Easily has the potential to occur | Happens often, known records of this |
| Consequence  | Very Severe (5) | Death, long-term disability             | Risk Score =<br>5 * 1 = 5 | 10   | 15                               | 20                                | 25                                   |
|  | Severe (4)      | Major injury                            | 4                         | 8  | 12                               | 16                                | 20                                   |
|  | Moderate (3)    | Heavy flesh wounds, black-outs          | 3                         | 6  | 9                                | 12                                | 15                                   |
|  | Minor (2)       | Cuts & scrapes, no long term effect     | 2                         | 4  | 6                                | 8                                 | 10                                   |
|  | Negligible (1)  | Short-term illness, First Aid treatable | 1                         | 2  | 3                                | 4                                 | 5                                    |

### 3. Risk Management – What can you do to prevent these risks?

- Does the risk classification change if you do anything?
- What needs to be done, when does it need to be done and who should do it?
- Check that risk management has been carried out!

There are several hierarchies of risk management. This one explains that there are six levels of control over risk management:

- **Elimination** – remove the risk altogether, don't undertake the task.
- **Substitution** - use an alternative, less risky method to achieve your desired result, e.g.
- **Engineering** – A physical solution to reduce the likelihood or consequence of the risk, e.g. a stop barrier before a low-speed zone.
- **Administration** – Put in place rules and policies which prohibit or restrict actions which have inherent risk, e.g. a speed limit.
- **Behaviour** – undertake training aimed to lessen the consequence and likelihood of the risk, e.g. machine operator training.
- **PPE** – use Personal Protective Equipment to lessen the consequence of the risk, e.g. hard hat, steel toe cap boots.

Risk should be managed at the highest levels practicable; further down the levels the less protection exists against the risk as more co-operation and supervision is required to ensure that the measures you are taking are being carried out. Figure 3 explains this in an example applied to an identified risk; having a car accident when travelling to work.

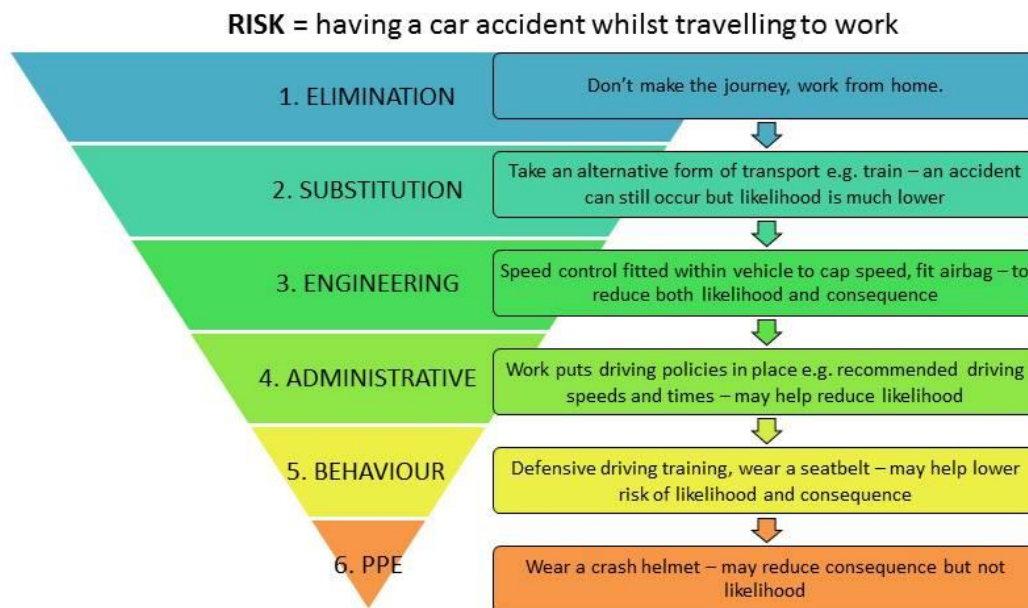


Figure 3 Example of the hierarchy of Risk Management applied to an identified risk

Adapted from: BS OHSAS 18001

### Contingency and emergency planning

A contingency plan is an alternative plan to be put into operation if needed; the 'plan B' that is required to ensure that the fieldwork is able to continue safely in foreseeable circumstances, whether or not emergency plans are invoked. Contingency plans should include a second option for all logistical and safety considerations.

Emergency planning should, where relevant, cover the following:

- Methods for contacting next of kin.
- Available support.
- Missing persons procedure.
- Civil unrest and natural disasters.
- Medical emergencies and repatriation.
- Financial plan for emergencies.
- Communication strategy.

Where partner institutions or other third party groups providers, have roles or responsibilities in the emergency plan, it is vital that they are briefed on these and have copies of the emergency plan. Dealing with a medical emergency is a possibility which should be considered for all fieldwork including supervised fieldwork and independent fieldwork. Considerations include the duration of the work, the remoteness of the destination, the fitness of participants, the access to hospital facilities and standards of health care available in the country.

Contingency and emergency plans should both include headings such as:

- Incident.
- Action.
- Person responsible.
- Key contacts for this action.
- Communication required.

## PRACTICAL CONSIDERATIONS

Practical considerations are related to logistics, equipment and functional aspects of preparation for field work and should include:

### Kit and equipment

This includes personal items that the student will require such as documentation, clothing, medication, first aid kit, as well as technical equipment the student will require to conduct the field work. This may include lab testing equipment, personal protective equipment (PPE), notebooks, handheld GPS, surveying equipment etc. Important considerations here include the reliability of kit and equipment, which includes hard-case or waterproof containers for delicate items, spare batteries, charging cables, suitable adaptors, extra memory devices,

and similar. The student should carry the least amount of valuables possible and should ensure that any expensive university equipment is covered by university insurance.

### Training

Proper consideration of what training the student may require before departure is important. This may include first aid training, language training, training on use of equipment, security briefings and local inductions.

### Customs (at port of entry)

This should include considerations such as permission letters for specific equipment or samples that students will bring in or out of the destination country, and an understanding of limits of currency and equipment that may be brought in or out of the destination country.

### Language

Considerations should be made for translation if this will be necessary during the student's field work. This should include official languages of the destination country as well as local dialects or tribal languages. Translation assistance should be considered for day-to-day interaction as well as preparation of field work such as the need for written forms or surveys to be used by local partners.

### Communications

The student and tutor should set-up a communications plan before the student departs. This should include confirmation of arrival, how to communicate during an emergency, regular meetings for academic and pastoral purposes (e.g. weekly), and for debriefing before leaving the field work country. It should be clear if the communications should be made by telephone, e-mail, skype or similar, and what the back-up option should be if the preferred method of contact fails. The use of a local mobile phone by the student should also be considered.

### Arrival and departure considerations

Both arrival and departure arrangements should be very clear before the student leaves for the destination country. This should include arrangements for the student to be met on arrival, with a contact for the person meeting them, and transport to their accommodation. Similarly this should be the case with departure considerations.

### Accommodation

Accommodation should be pre-arranged and wherever possible it should be approved or visited by a local partner prior to the student's arrival to ensure that it is safe. For safety reasons, good practice is to avoid ground floor rooms that can be easily accessed by a window, and avoid rooms on very high floors because of evacuation risk, in case of fire or another event. There should be measures in place for the student to be able to keep valuables safely, if not at their accommodation then with a partner group.

## Transport

Transport for movement during field work should be pre-arranged with back-up options also considered. This will highly depend on the type of work the student is undertaking and the location they will be visiting. The student should undertake travel plans during their field work and leave these with the local partner or communicate them to their tutor. It is not advisable for a student to drive abroad, due to differing legislation on driving and action that may be taken if an accident occurs.

## Culture

Culture is a very important factor in the planning, delivery and overall success of any field work project. Firstly the student may experience culture shock on arrival, and possibly reverse culture shock on returning to their home country after the field work. This should be accounted for in a pre-departure briefing and pastoral support during and after the field work. Within field work culture will likely affect:

- Greetings and introductions, especially when entering a new community or group of peers;
- Ways of working, with regards to time management, punctuality, transparency and group dynamics;
- Reception of evaluation or criticism, with respect to the research that is being carried out;
- Security within the field and how locals interact with foreigners;
- Issues of conscience, where the student may feel injustice is being done, but it is not safe or socially acceptable for them to express this.

Useful skills relating to the student adapting to a new culture in field work include:

- Flexibility – being flexible with time and priorities.
- Adaptability – being open to new practices and style of living.
- Tolerance & patience – being accepting of things they may not approve of at home, being open to working on a different 'time' to what they're used to, giving

themselves time to understand the new culture and being tolerant of other people's ability to understand them.

- Diplomacy & negotiation skills – knowing where their comfort zone extends to and being able to explain any discomfort they have with the new culture in a suitable and polite way.
- Language & communication skills – tailoring communication to suit a new audience and convey points clearly without seeming patronising or pitying.
- Keeping a record – a journal, blog, photo album, emails home, videos etc. Recording the experience will help to reflect on things that they have learnt and put into perspective uncomfortable or difficult experiences.

### Data collection and storage

Regarding data collection and storage, key issues in the field include data identification, data confidentiality, data security and backing up data. The student should plan their data management and understand the data flow that will take place during their project – see Figure 4 for a simplified version of data flow. Here data is collected during field work in either paper forms or directly in a computed version. If it is collected in paper forms, the computed version will need to be created from the paper forms. The computed versions are compiled to create a control data base of the original data. An operational database(s) can then be developed which selects and analyses the most relevant data to specific questions, or may take a sample from the control database for deeper analysis. From this the report and feedback can be developed.

In order to build a data management plan and data flow diagram the student must consider:

- Type of data being collected.
- How the data will be collected - paper form or an electronic form (e.g. laptop or tablet).
- Form of data back-up.
- Data security and confidentiality throughout.

If the data collection utilises enumerators or other staff then they will have to be properly trained in how to collect the data; including ethical considerations, interview techniques, operation of lab equipment or use of software if a tablet or similar is being used.

Clear responsibilities and procedures for collecting and storing must be established and covered with the individuals involved in data collection. Throughout data collection and storage, data security and confidentiality should be considered at all times. Paper forms should not be left unattended to be seen by unauthorised persons or to get lost, and should be stored in sealed containers. Original (raw) data collections should not include personal information of any research participants, but instead should assign a subject ID code.

Regarding data security and confidentiality of electronic data, computers and workstations should be locked when they are not in use, and stored in a safe place. Data should not be archived in personal directories or local computer's hard drives. If data is particularly sensitive then it should be encrypted.

Data should be backed-up regularly on an external storage device and if possible through a secure on-line program. Data back-ups, or transfers, should be logged everytime they are undertaken. Changes to the data should be documented, with versions of the data saved under different names, e.g. v1, v2 etc. Original raw data should be backed-up and remain unchanged.

Routine checking procedures should be carried out on the data during all stages to ensure complete data records, no errors and no lost or mixed-up records. This may include visual checking of the data during collection, e.g. revising paper forms, as well as built in checks within databases, e.g. filtering for duplicates or apparently erroneous values.

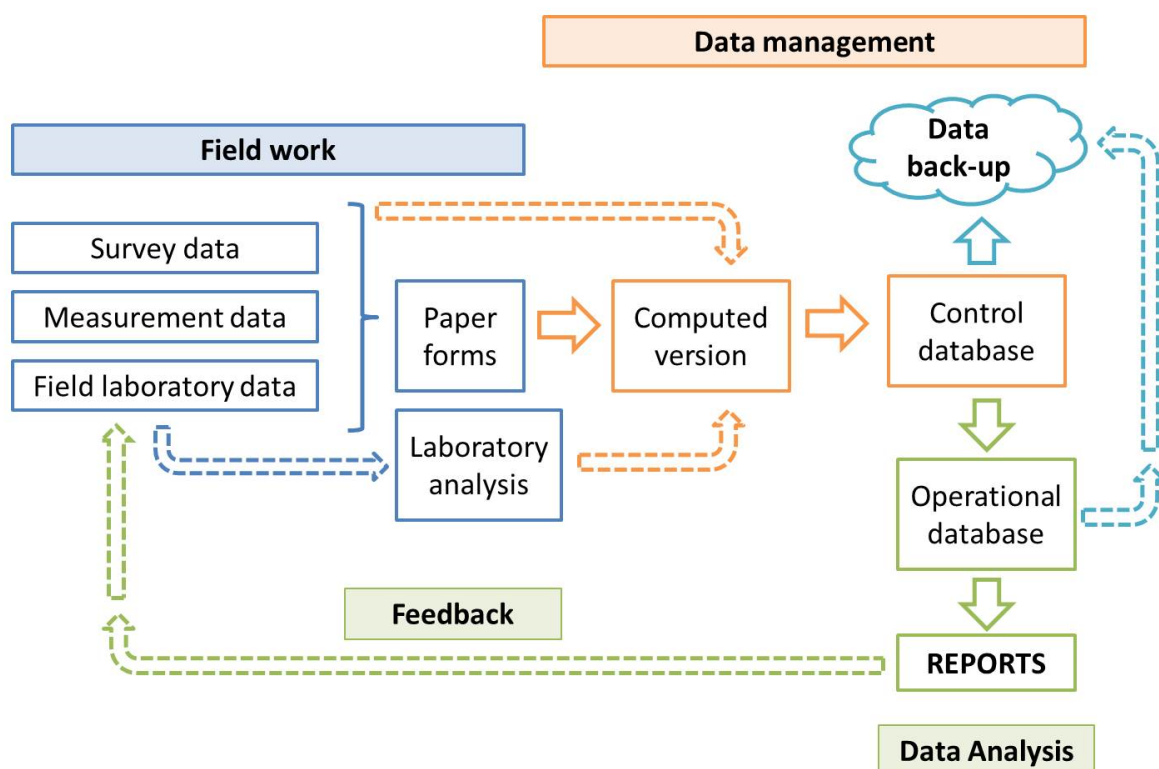


Figure 4 Simplified example of data flows within a field project

## CONCLUSIONS

Proper planning should be utilised to maximise the efficiency of the student's time in the field. The following tools described in this chapter can assist the student and their academic supervisors in this planning process:

- Calendar.
- Gantt chart.
- Logical framework.
- Checklists.
  - Overall pre-departure checklist.
  - Documentation masterlist.
  - Field risk and hazard checklist.
  - Packing checklist.
  - Contact list.
  - Field checklist.
- Communications plan.
- Risk Assessment.
- Contingency plan.
- Emergency plan.
- Data flow diagram.
- Data management plan.

After the student returns from the trip it is very important that they undertake a full debrief. This should include a review of their research achievements during field work, any difficulties or challenges they faced in terms of their research and importantly a focus on their personal experiences in the field. It is important for this pastoral aspect to be included as a reverse culture shock on returning home is often overlooked.



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## FURTHER/SUGGESTED MATERIAL

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### Culture

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### For professors organising groups of field work

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### Safety & Security

CIA World Fact book: <https://www.cia.gov/library/publications/the-world-factbook/index.html>  
Craig, G. Corden, A. and Thornton, P. (2000) Safety in Social Research, Social Research Update, Issue 29: <http://www.soc.surrey.ac.uk/sru/SRU29.html>

### Health

The Hospital for Tropical Diseases: [www.thehtd.org/content/travel.asp](http://www.thehtd.org/content/travel.asp)  
WHO International Travel Health: <http://www.who.int/ith/en/index.html>  
CDC Travellers Health: <http://wwwnc.cdc.gov/travel/>  
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PHOTO: Volunteering in Rural schools in the province of La Union, Arequipa, Peru. Alejandro Garcés

# 5

## CHAPTER

# Academic reporting and feedback to stakeholders and society

# 5

## CHAPTER 5. Academic reporting and feedback to stakeholders and society

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# 5

## ACADEMIC REPORTING AND FEEDBACK TO STAKEHOLDERS AND SOCIETY

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*The most effective communication is achieved when receivers make the message their own*

### EXECUTIVE SUMMARY

You may well have heard the phrase "What is not communicated does not exist". Without wishing to be dogmatic, it is certainly true that, in the worlds of academia and research, every effort must be made to communicate work carried out, as this is the only way to ensure that progress and innovation are pollinated to other places and areas.

Communication requires time and effort which we are not always prepared to allow for except, that is, unless we either have a special vocation for the area, a personal fascination for using new communication channels to share information or we enjoy using them in our free time. We are talking about Social networks such as Facebook, Twitter or the more recent and differently focused instant message applications like WhatsApp.

In this chapter we will look at a new way of communication which encompasses much more than simply publishing results, a respective press release and waiting for public reactions. Here we will put forward the idea of active communication throughout the whole research process in which we generate diverse formats and open our own channels of communication. In this type of communication, thanks to new technologies and the ways in which Internet allows us to interact, it is the people themselves who become the media for communication. Channels are now multidirectional allowing us to receive continuous feedback on the research or project we are working on.

## LEARNING OUTCOMES

After you actively engage in the learning experiences in this module, you should be able to:

- How to generate communication messages from the research carried out.
- How to define, encompass and reach the target audience.
- Examine different kinds of communication formats and products which can be generated by the research itself.
- How to find the most appropriate communication channels for the investigation undertaken.
- How to set out a communication plan which develops alongside the research process as a whole.

## KEY CONCEPTS

These concepts will help you better understand the content in this session:

- **Target audience:** Organisations and individuals grouped by subjects, location, interests... who we wish our research to reach.
- **Communication 2.0:** a new form of communication developed through multidirectional channels, not limited solely to communicating results, but also to generating discussion on the research or project undertaken.
- **Communication formats and products:** form the "wrapping" for the messages we wish to present. These products serve another role too in that they help us to look at our own research from different angles.
- **Communication channel:** is the medium used to spread communication products. Nowadays these channels are not exclusive to the mass media, rather they are available to anyone wishing to use them.

## GUIDING QUESTIONS

Develop your answers to the following guiding questions while completing the readings and working through the session:

- Which messages can you extract from your research that will make it attractive to your target audience?
- How can you generate widespread discussion on your research?
- How can you create a group interest in your research?

## INTRODUCTION

Over the last few years our way of communication has changed considerably thanks primarily to technologies which have allowed us to take it much further than the classic mono-directional model reserved, until recently, for the traditional media.

The communication tools offered by new technologies have become essential in the publication of academic studies to predetermined target audiences. They are even more effective however in allowing us to communicate not only the results of our studies but also the study or research processes themselves thus enabling us to share the doubts, ideas and solutions which we discover on the way.

In this way we can construct a narrative whereby we can evaluate our own work, communicate why we consider it important and even (when necessary) come across unlikely connections which give us a deeper insight into our work. In other words, this new form of communication clears paths to make way for the creation of collective intelligence, crowdsourcing.

For this reason the academic reporting and feedback which we send to our stakeholders and target audience should aim to generate dialogue which either enriches our own studies and research or opens doors for their practical application.

Taking John Bessant and Joe Tidd's '4Ps' as a base, it is possible to construct a model in which all these changes and innovations which have taken place in recent years in the field of communication figure:

- **Innovation in the product:** Messages adapted to different channels and target audiences including three levels of communication, the first more superficial based on short messages, alerts and small-scale interventions on social networks, a second, deeper level whereby the audiovisual dominates the textual, and lastly a more profound level in which the receiver analyses the given message in more detail. In these cases it is the hypertext which permits cohesion among the three levels.
- **Innovation in the process:** Truly successful communication begins as soon as the project, study or research itself is initiated. In this way objectives, methodologies, ideas and even doubts can be shared. The multitude of communication channels which exist nowadays allows us to choose not only which ones will be most appropriate for our target audience but also how to best manage them using applications which help to bridge the gap between online and offline spaces.

- **Innovation in the position:** Until the twentieth century communication took place essentially through conversation. With the advent of the mass media (the press, television and radio) communication became unidirectional, involving one single transmitter and a multitude of receivers-the audience. In the twenty-first century however, where networks play an essential role in communication, we have recuperated its multi-directional nature. Of the three components which make up a network- nodes, relationships and messages-communication now places more and more emphasis on relationships. Thus the message strengthens the relationship and depending on the function of the message the nodes tend to become more personalised.
- **Innovation in the paradigm:** People make up the nucleus of the new paradigm in communication because they have the power to spread messages without the need for intermediaries. People themselves have become a potential media for communication.

This chapter will offer a series of ideas which aim to help researchers find ways of spreading not only their results but their working processes too. The researcher will be invited to undertake an exercise in radical transparency based on the premise that the more we share the more we benefit from the feedback we receive. Each individual will have to decide how far they take this type of communication model on board, but it is fair to say that the more we limit ourselves, the more we limit the ecosystem of collective knowledge surrounding the study or research we hope to share.

## RELEVANT, UNDERSTANDABLE AND ACCESSIBLE

In spite of the radical changes in the field of communication caused by a combination of the influence of new technologies and the new needs arising from an ever more liquid society (to use Zygmunt Bauman's term), there are axioms and premises which do not change and still serve as useful guides to ensure high quality communication.

In order for our communication campaign to have an impact the information to be released must be relevant, understandable and accessible. This involves extracting and adapting all manner of messages and data from your research before shaping them to present to your target audience. In order to do this you must proceed in a way which will eventually help you to create a communication strategy.

- **Relevant information:** Traditionally, for any professional in the field of communication, the most important part of any research will be the results or conclusions of the study. However it is important not to undermine the value of the process which leads to those results. For this reason, and as we have already underlined, it is always preferable to start the communication campaign



alongside the research itself. When outlining messages this will help you decide which are more or less relevant, not only that, you will be able to pinpoint other aspects more accurately such as what makes the study necessary and what impact it will have.

- **Understandable information:** One of the challenges we face is how to adapt our language; how to avoid the overuse of technical terms in initial interactions, how to make sensible use of initials. This chapter will outline some communication products which can be used to help spread the information you wish to communicate.
- **Accessible information:** Nowadays, when it comes to spreading information, many different channels are at our disposal. The key however is to know how to select the appropriate channel for your target audience. The more defined your target audience, the better you can choose channels to suit them.

## RESEARCH AND ITS KEY MESSAGES

Before beginning to extract the key messages from your study or research you must clarify its objectives: Will it constitute a theoretical framework for further research? Will it have practical applications? Will it change patterns or ways of working? Does it offer appropriate tools or educational material etc.?

These objectives will help to decide which parts of the research process are important to highlight. When deciding which it is important, try to clearly pinpoint the information which is truly relevant, be it visual or emotional. In doing this you will be able to construct a new narrative to use alongside the research itself and which will prove to be your point of reference when communicating to the target audience.

At the start of any research project it is important to incorporate a calendar with 3 to 5 key stages dedicated to the communication of the project. One of these stages must of course be the end of the project when results are published. Here are some suggestions on how to proceed at each of these stages:

- Pinpoint the main idea contained in the study.
- Find any visual information which would make sense if published in isolation, e.g. quantitative data, statistics, images, graphs, etc.
- Look for a good title which reflects what is most relevant in the research at that given moment.
- Consider publishing problems and concerns which have arisen in order to share them with your target audience.
- Edit the messages which you intend to communicate to make them easily understandable for the target audience.

- Link the information you intend to publish in the latest bulletin with information given previously.

The Innovation and Technology for Development Centre (itdUPM) has carried out a consultancy for Multilateral Investment Fund (MIF), part of the Inter-American Development Bank, on five case studies on the provision of basic services to low-income communities in Latin America and the Caribbean.

A communication plan was developed as part of the consultancy which provided information throughout the process. The key stages chosen for communication were:

- The start of the consultancy: Communication of the five case studies chosen and of the criteria for selection through various communication channels including links to the websites of the organisations responsible for the research where their information on the cases was published.
- First impressions: Including the publication of several posts (see Guatemala: Access to Health in Rural Areas and Creating the space for innovation – eThekwini Water & Sanitation Unit) on the MIF blog on impressions and initial analyses of the consultants after having visited one of the selected projects.
- Graphic outlines of each of the case-studies: the publication of infographics of each case (see Peru's infographics) detailing the most innovative aspects of each one.
- Final publication: The publication of results (expected to July 2014 in [www.itd.upm.es](http://www.itd.upm.es)) along with audiovisual material and messages adapted to the three levels of communication outlined earlier.

## THE TARGET AUDIENCE

Right from the start of the research project it is important to work with an open document containing all the contacts who you will be sending information to as well as all those such as financiers, stakeholders, academic institutions, businesses or the general public, who you will have to report to concerning progress and results.

Different target groups will have different interests in the research, it is therefore important to remember to send relevant information and to ensure that this information is published at each of the stages mentioned earlier.

Some target groups will be easy to identify and to reach, usually those most involved with the project itself. These include financiers, collaborators and, in the case of development projects, beneficiaries. There are always however other target groups whose interest in the

project may be personal or professional. Although more numerous they will prove more difficult to pinpoint.

In order to be able to contact these groups it is important to first carry out a segmentation exercise to determine the reasons behind a particular group's interest in the project. This process of segmentation can be carried out according to factors such as demographic or geographical criteria, personal or professional interests or even according to how useful the research will be for a particular group. The objectives of the research itself may even help you establish who you need to communicate information on results and processes to.

Once you have established the segmentation groups you can begin to slot each of your contacts into place, trying to be as specific as possible in the process. If you limit yourself into believing that your research is of very general interest we will find that your capacity for effective communication diminishes. Having organised each of your existing contacts you must now find those new target groups. Time to look on the net.

Internet has revolutionised communication but there have been changes at other levels too. The constancy and flexibility of interpersonal relationships has changed, so too how we form groups.

Many of those who actively use the Internet already belong to several networks be they social, professional, thematic, specific, linked to an event or, in the case of fluffy-kitten-picture-sites, for entertainment.

The key to the success of these networks is that, apart from bringing together people with shared interests, they tend to be highly dynamic spaces, continually transforming, in some cases even ephemeral. Many, as a quick look at Facebook will reveal, have a highly fluctuating membership with sporadic interventions from their participants.

True to the nature of communication however, here too we find different levels working, some deeper, others more superficial, depending on the constancy of the network involved. Our new digital relationships have taught us some lessons and we now see a tendency towards the creation of more stable and solid virtual communities. Good examples are applications such as Whatsapp, some professional and corporate networks like Yammer, the new developments in Wordpress or the opportunities offered by LinkedIn.

In order to achieve effective communication it is crucial to be able to operate on these levels, not only on the superficial for the more ephemeral networks, but also to be able to reach the communities related in some form or another to the subject matter of the research.

In each and every one of these networks we must find the most appropriate way of sending our messages. It is not always as easy as it sounds. It is important to be familiar with the networks themselves in order to avoid sending out messages which may be perceived as intrusive or opportunist and therefore actually prove harmful to your cause. A technique which often works is to try to familiarise yourself not only with the networks themselves but also with those individuals who have most influence over those networks. Why? Because the most effective communication incites the target audience to dialogue and to call your message its own. An analysis of the most active profiles on Internet- social networks, blogs, virtual communities etc. and of offline spaces will serve to help find these influential individuals who in turn will help you get your message across.

In the consultancy mentioned above on five case-studies on the provision of basic services to low-income areas in Latin-America and the Caribbean, the itdUPM and MIF were careful to pinpoint their target audience groups and define the main message which should reach each one right from the start of the project.

| TARGET GROUP   | WHERE TO FIND THEM  | TYPE OF MESSAGE   |
|--|---|---|
| Researchers, technicians and academic staff.   | Universities, research centres, online professional networks.   | Methodology used, innovative aspects of the consultancy etc..   |
| Promoters of the projects involved in the consultancy.   | Established contacts within the consultancy.  | Results of the consultancy  |
| NGOs and public and private institutions in the countries where the projects are taking place. | Active searches using existing contacts, projects on similar subjects, presence on social networks... | Can certain aspects be reproduced in other contexts?<br>Could the project influence public policy making? |
| International development agencies related to innovation.                                      | Official websites, research contacts, NGOs involved in international programmes etc.                  | Innovative aspects of the projects, methodology, results...   |

Table 1

## COMMUNICATION PRODUCTS AND FORMATS

Although a study or research project is obviously a communication product in itself, the more superficial levels of communication need to be filled in using complementary products and

formats. These will cater for a less specialised, more diverse audience but will also provide a new perspective when observing processes and results.

A format refers to the specific communication channel through which we choose to publish our research e.g. Audiovisual, textual or through various data visualization techniques. The communication product on the other hand, contains the message presented within that format and could be for example a video, an infographic, a poster, a post on a blog or a press release.

Communication formats and products are other aspects which must be given consideration right from the outset of the study or research project. Some of these products will require data or additional information not provided within the study itself such as images, testimonials, personal accounts and contextual data, all of which will help you construct a parallel narrative to the actual study.

**Audiovisual Material.** Be it image or video, audiovisual material is ever more important in communication in general and in this context particularly. The images and videos chosen should transmit the objectives of the study but should also make the research more tangible. If you are dealing with a problem, choose an image which reflects that problem, if you see solutions, show solutions through your audiovisuals. All too often we see images of infrastructures and installations devoid of people. These images lose any communicative power. If research is undertaken in order to help people then people must be reflected in most of the images and videos used.



**Figure 1** These two images come from a health access and information technology in rural areas programme run by an NGO called Tulasalud in Guatemala. The left-hand image shows the nursing school which plays a fundamental role in the project. The image chosen however, fails to communicate the importance of their work, we see no human aspect, only an empty school building. The right-hand image depicts a community worker attending to a neighbour in his own district. Here we have a testimonial, a real-life story. (Photos: itdUPM)

The **testimonials or personal accounts** of the beneficiaries and others most closely involved at ground level of a project offer a meaningful vision of the problem or the solution in hand. If dealing with access to basic services such as water, electricity or health, the most

valuable accounts come from the beneficiaries and providers of these services (doctors, patients, teachers, students, local mayors, community leaders direct beneficiaries, etc.). In the context of communication material these accounts should always be accompanied by an image or video of the speaker themselves, always of course with their express permission to publish the material afterwards.

Another ever more popular and useful resource in synthesizing material for publication is the **infographic**. The way in which an infographic is constructed breaks up the classic introduction-climax-ending formula and instead invites us to construct a narrative using quantitative or qualitative data which reflect the most important aspects of the study. Anyone designing an infographic for a research project will need the most relevant quantitative data extracted in order to effectively communicate both process and results.

*Download the infographic here:*

[https://www.dropbox.com/s/m1bsmvgoywsgb3s/INFOGRAFRIA\\_EN\\_GUATEMALA.pdf](https://www.dropbox.com/s/m1bsmvgoywsgb3s/INFOGRAFRIA_EN_GUATEMALA.pdf)

*This visual representation shows the key points of the Access to Health Services in Rural Areas programme carried out by the NGO TulaSalud in Guatemala. It includes the latest available results, successful aspects of the programme and its potential for duplication in other contexts. It forms the basis for a 3 page informative publication on the program Author: itdUPM and MIF.*

**Maps and geolocation tools** can make good visual resources particularly when representing a research project taking place in several different and distant locations. Google Maps ([maps.google.es/](http://maps.google.es/)), OpenStreetMap ([www.openstreetmap.org/](http://www.openstreetmap.org/)) or Ushahidi (<http://www.ushahidi.com/>) are tools which require no specialist technical skill and which allow users to quickly generate maps showing specific locations together with the information they wish to highlight about each place.

A research project or academic study will usually produce **one or several publications** and it is our target audiences who will determine which kinds are produced. The main publication will almost certainly be one in which the whole research project figures, another, more reduced and more visual, will serve a less specialised audience and finally there will be articles taken from the study in order for publication in either specialist or general media.

A more dynamic and ever more popular way of communicating research however is via **blogposts**. This mix between a news item, a comment and a story proves less formal than a traditional article. Blogposts should always appear signed by the collaborators and authors of the research. Aspects to be published via blogposts can be decided on from the beginning but the more interesting ones tend to emerge as the research unfolds. A particular event or aspect, an anecdote or interview or even a story told based on an image can all inspire compelling blogspots.

*The Access to Health Services in Rural Areas programme carried out by TulaSalud in Guatemala is one of the five case-studies for the provision of basic services to low-income areas in Latin-America and the Caribbean analysed by itdUPM for MIF. The consultant on this case wrote the following post on the MIF blog after visiting the project:*

*<http://www.fomin.org/HOME/FOMINblog/Blogs/TabId/628/ArtMID/8837/ArticleID/2223/Guatemala-Access-to-Health-in-Rural-Areas.aspx>*

Lastly **slideshow presentations** are always useful. Alongside the standard programs such as Powerpoint by Microsoft or Impress by Open Office new, more dynamic tools like prezi (<http://prezi.com/>) or sozi (<http://sozi.baierouge.fr/>) have emerged which break the linear structure of the narrative and not only serve to create public presentations but also to visualize research as an abstract on a website before downloading.

*The following presentation created using prezi was shown by the itdUPM as part of the international EESD13 conference with the intention of demonstrating how to use innovation models as vehicles for learning based on the consultancy on five case-studies for the provision of basic services to low-income areas in Latin America and the Caribbean.*

*<http://prezi.com/lf7kag-3mjxl/presentacion-cambridge/>*

## COMMUNICATION CHANNELS

The communication channel is the medium by which communication products reach your target audience. Each communication product will have one or more appropriate channels. In this section we will discuss some of the more useful channels but it is also important to know how to best take advantage of the existing channels surrounding the research project or stakeholders themselves.

Communication channels can be unidirectional or multidirectional. The former being primarily the traditional mass media of the twentieth century and the latter meaning new media which allow for interaction between themselves and their target audiences. If you wish to encourage discussion on your research then you should clearly be looking towards these new multidirectional channels, all of which feed back into each other via many means including hypertext, embedded audiovisuals and content generated through interaction with the target audience.

Nowadays we find that many organisations not only publish on the Internet but actually have their own channels. For this reason it is useful to start with a list of such organisations willing to help spread your communication products via their channels.

All academic studies or research intended for widespread publication should have their own web spaces preferably within the website of the organisation promoting the research. This space will serve not only to publish the report but also as a showcase for any other communication products generated alongside the report. This space is also a first point of contact with your target audience where hopefully you can capture them using audiovisuals, images and presentations, but also serves to communicate at a second level whereby you make the research available for widespread publication.

The posts mentioned earlier should of course have their own corresponding blog. This could either be one created specifically for the research in hand, but in this case frequent updating is recommendable, or use the blog belonging to the organisation promoting the research or responsible for the project.

**Newsletters** continue to be an important communication channel but rely heavily on databases. Whether or not newsletters are used in your organisation, you should try to track down newsletters from other organisations and ask for support in spreading your information through them.

**Social networks** are the primary multidirectional channels in any communication strategy. We can compare them to one large room where a multitude of people are discussing various subjects, some louder than others, some in big groups others in smaller ones. If you burst into the room shouting out your message you will be considered intrusive and therefore lose all credibility for anyone still prepared to listen to you. A much better strategy is to try to find out which groups have interests in common with your own and who has a relevant profile to the message you wish to communicate.

For this reason, your first task when using social networks should be to seek out the target audience for your research. If you do not actually have your own profile on these sites you can still use them to look for those with profiles which are in some way related to your research, preferably high profiles on the site, who will agree to actively collaborate in communicating your research and /or contribute to discussions generated by it.

The table below outlines some aspects of each network and how they can be of use in building a communication strategy.



|          | Personal profile | Institutional profile | Page | Subject groups | Subject lists | Target audience search | Direct messages |
|----------|------------------|-----------------------|------|----------------|---------------|------------------------|-----------------|
| Twitter  | x                | x                     |      |                | x             | x                      | x               |
| Facebook | x                |                       | x    | x              |               | x                      | x               |
| LinkedIn | x                |                       | x    | x              |               | x                      | x               |
| Google+  | x                |                       | x    |                |               | x                      | x               |

Table 2

In Twitter, for example, it is possible to look for personal and institutional profiles through its search engine as well as through subject lists where these profiles are grouped together. The subject groups in Facebook and LinkedIn can be good places not only to find profiles but also to spread messages. Lastly, it is possible to send direct messages through social networking sites but almost always on the condition that some mutual link has already been established, for example two people/profiles on Twitter or Facebook who have been following each other.

**Audiovisual channels** such as Youtube, Vimeo, Flickr, Pinterest and Instagram are useful for presenting images and video generated on your research and for embedding them into web pages, blogs or for sending links to them through the social networking sites mentioned earlier. Most of these channels are also considered social networks themselves because they serve to generate active participation, commenting on content and adding new audiovisual material to the channel.

*In 2013 the United Nations Development Programme (UNPD) held a contest #communityheroes via the social network and audiovisual instagram. Internet users were asked to publish on the site a picture of someone they considered to be the local hero of the neighbourhood in which they lived, along with a short text explaining why they had chosen them. The result was a page displaying hundreds of modest stories of ordinary people who, through their actions, had helped to change the world. <http://statigr.am/contest/pwhx/communityheroes-photo-contest>*

The kind of communication which is generated through these multidirectional channels very often leads to some kind of action on the part of the target audience such as comments on a blog, messages on Facebook, tweets and new posts on thematic blogs. All these reactions constitute an extremely valuable source of communication material which can be put together and broadcast back onto these channels: this is exactly what tools such as Storify allow us to do. Storify is a tool which allows us to drag these messages to its website where a code is generated which, when embedded back into another site or blog, displays all these reactions together.

*'Organizing For Action is an organisation supported by the US president, Barack Obama ,which carries out campaigns based on some of his election promises such as the so-called "Obamacare" campaign , gun violence prevention or immigration policy. Their website shows all messages, images and videos related to the subject posted by users on social networks using the same technique as Storify' (<http://l.barackobama.com/stories/gun-violence/all/all/>)*

**Mass Media:** radio, television and the press are not usually the first channels used in the communication of studies or research mainly because of the time restraints these impose and also because of the difficulties involved in making any sort of impact in these media. It is important to bear in mind however, that if a news item should arise which is in some way related to your research it may be a good idea to use the situation to your advantage and release a press statement about your research to the media covering the story.

**Specialised media** are however important channels through which you can get your work known. In these cases articles usually require signing by the author or by a member of the research team and are published alongside illustrative images. Again, if you plan for these kind of articles from the outset, you will find it easier to get them published when the time comes.

**Public events** are a good opportunity for showing research, or a particular aspect of it, to your target audience. If you choose to organise an event solely with the purpose of communicating the results of the research, you will have to give careful consideration to the format the event will take. If the objectives of the research are mainly formative or to use the results to guide the development of further projects, you might want to combine a traditional event with some kind of workshop. There are many tools available which allow us to broadcast such events online with relative ease and even permit the combination of offline and online participation. The **hangouts** by Google or streaming services like **Ustream** or **Livestream** are examples of such tools and they can be used in conjunction with others such as Visible Tweets at public events to project the tweets published by users about your research in real time onto a space in the room in which the event is taking place. For this you will need to have previously defined a **hashtag** such as #communityheroes. used by UNPD and mentioned above.

Lastly, most multidirectional channels use impact indicators which help to assess acts of communication, mostly these will simply be the number of visits to a particular online space, but the best indicators are, without a doubt, the reactions which you will provoke in your target audience.

## THE COMMUNICATION PLAN

We have discussed a large number of communication products and channels. When the time comes to outline a communication plan you should select which ones you consider most appropriate, taking into account factors such as the pace of the research, key stages and deadlines. The scheme below incorporates these many elements:

| ACTION   | TARGET AUDIENCE   | COMMUNICATION FORMAT/PRODUCT                                      | COMMUNICATION CHANNEL   | IMPACT INDICATOR   | Date 1 | Date 2 | Date 3 | Date 4 |
|--|---|---|---|--|--------|--------|--------|--------|
| Share the methodology of the research  | Academic  | Post<br>Article   | Blog / LinkedIn<br>Specialist journals                              | Nº visits to blog / Nº Commentaries<br>Nº copies published                                 |        |        |        |        |
| Give visibility to the most important individuals involved in the project            | Stakeholders  | Video interviews  | Youtube / web<br>Social networks                                    | Nº Visits to the video<br>Comentarios on social networks                                   |        |        |        |        |
| Publish the first results of the research.   | All pre-determined audiences<br><br>Financers           | Post<br>Short messages on networks<br><br>Personalised newsletter | Blog<br><br>Social networks<br><br>email                            | Nº visits to blog<br><br>Comentarios on social networks<br><br>Percentage of emails opened |        |        |        |        |
| Capacity for extension of the project model to other locations                       | Public and private institutions with similar interests. | Infographics  | Websites<br><br>email   | Nº visits to web<br><br>Percentage of emails opened  |        |        |        |        |
| Generate a web in collaboration with researchers and professionals in the same field | Academic<br>Profesionals                                | Post<br>infographics<br>Short messages on networks                | Social networks<br>Virtual communities of professionals             | Comentarios / reactions on social networks and virtual communities                         |        |        |        |        |
| Final publication of the research  | All pre-determined audiences                            | Public event  | Physical space / email / social networks/ broadcasts using internet | Nº attendants  |        |        |        |        |

|  |                          |                   |         |                 |
|--|--------------------------|-------------------|---------|-----------------|
|  |                          |                   | Website |                 |
|  | Financers / Stakeholders | Workshop/ Webinar |         | Nº participants |

Table 3

As well as a general communication plan for your research, it is also possible to make a more specific one aimed at a channel of particular strategic importance. The scheme below demonstrates such a plan applied to the social network LinkedIn:

|                               |  |
|-------------------------------|--|
| <b>Specific objective</b>     | Dissemination of university research   |
| <b>Target audience</b>        | Lecturers, students and researchers  |
| <b>Communication channels</b> | LinkedIn   |
| <b>Actions</b>                |  |
|                               | 1- Creation of a group on LinkedIn on the subject covered by the research as well as posting of initial content about the research |
|                               | 2- Search for profiles, pages and target audience groups on LinkedIn   |
|                               | 3- Broadcast the group amongst the target audience.  |
|                               | 4- Weekly updates by the group on content deriving from the research itself.   |
| <b>Results</b>                |  |
|                               | 1- The LinkedIn group has 200 profiles added and 15% participation   |
|                               | 2- 50 profiles show specific interest in the research  |
| <b>Indicators</b>             |  |
|                               | 1- Nº profiles in the group  |
|                               | 2- Nº updates  |
|                               | 3- Content generated by target audience  |
|                               | 4- Nº visits to the group  |
| <b>Time interval</b>          | 2 months   |

Table 4

## CONCLUSIONS

The objective of web-based communication is to impact on the nodes of that web - individuals- so that the relationships between them which are related to the research, broaden throughout the process via diverse communication channels. In order to achieve this we will use a series of messages presented through several different communication products.

This type of communication combines the traditional objective of reaching as many people within the target audience as possible with a more proactive approach, i.e. inciting reactions, comments and exchange of information. For this reason multidirectional channels, intrinsically linked to new technologies, form the best way, not only of reaching the widest possible audience, but also of enriching our own research.

Communication will thus no longer be considered a set of activities in isolation from research but rather will come to form a part of it, transverse, continual and present throughout the process. In this way communities with mutual interests can be formed who will keep up with progress of the research, not only that, but who will collaborate, provide data or help move the research to even wider circles. In short the kind of communication to promote crowdsourcing, i.e. the collective intelligence used to achieve a specific aim.

The examples of communication plans shown in tables 3 and 4 are perhaps a little ambitious for one specific project but they should help you bear in mind how to spread the messages and data yielded as the research progresses.

In this way you will be able to create and consolidate your own communication channels which will create stronger links with those interested in your project and will also be a useful base for the future as, once established, you can use your channels for other projects without having to start from scratch.

Lastly, the many communication products generated by research will not only serve to reach a wider audience but, in many cases, will also offer a visual map of all the relevant aspects and possibilities for further study contained within the project.

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## FURTHER/SUGGESTED MATERIAL

- Web site: BBC Media Action. Climate Asia. Communication Toolkit.  
<http://www.bbc.co.uk/mediaaction/climateasiadataportal/article/developstrategy>
- Resources: Visualisation Tools from Visualising Information for Advocacy.  
<https://visualisingadvocacy.org/resources/visualisationtools>
- Book: The Case-study Toolkit, Partnership case studies as tools for change.  
[http://commdev.org/files/699\\_file\\_Case\\_Study\\_Toolbook.pdf](http://commdev.org/files/699_file_Case_Study_Toolbook.pdf)
- Resources: Community Tool Box: <http://ctb.ku.edu/en>
- Resources: IDRC Toolkit for researchers:  
[http://www.idrc.ca/EN/Resources/Tools\\_and\\_Training/Pages/Toolkit-forresearchers.aspx](http://www.idrc.ca/EN/Resources/Tools_and_Training/Pages/Toolkit-forresearchers.aspx)

- Prezi presentation: Using case studies as learning vehicles  
<http://prezi.com/lf7kag-3mjxl/presentacion-cambridge/>



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